CONTENTS

| Chapter | | Page |
|---------|--|------|
| | Preface | v |
| 1 | Inertia Forces | 1 |
| | Newton's laws and the pressure gradient—Pressure gradient—Continuity—Confluence and convergence—The importance of sound—Bernoulli's theorem—Points of stagnation—Efficiency of catch—Dynamic soaring—Large air bubbles in water—General form of the law of fluid motion | |
| 2 | Motion on a Rotating Earth | 19 |
| | The deviating force—The relationship between pressure and wind—Motion in the upper air—Sutcliffe's development theorems—Fronts | |
| 3 | Vorticity | 49 |
| | Distortion and rotation of a fluid—The vorticity vector and vortex lines—Motion in a teacup—Properties of vorticity—The production of vortex filaments—Production of vorticity in the atmosphere by gravity—Vortex rings—Straight line vortices—Vortex pair—Vorticity on a rotating earth—Secondary flow—Instability of a vortex sheet | |
| 4 | VISCOSITY | 83 |
| | Stresses and strains—Kinetic theory of viscosity: transfer of momentum—The Reynolds number—Similarity—Efficiency of catch—The boundary condition in viscous flow—The conduction of vorticity by viscosity—Flow at low Reynolds numbers | |
| 5 | BOUNDARY LAYERS | 97 |
| | Flow at moderate Reynolds numbers—Diffusion of a vortex sheet—The growth of the boundary layer on a flat plate—Diffusion through boundary layers—The basis of boundary layer theory—Separation of the boundary layer—The growth and diminution of boundary layers—Cavitation and salient edges—Separation at bends and corners | |

| Chap | ter | 1 | Page |
|------|--|--|------|
| (| Flow Some decay The near —Th —Fo | at large Reynolds numbers—The drag coefficient— e properties of wakes—The definition of turbulence; y—The Reynolds stresses—Isotropic turbulence— problem of defining the mean flow—Turbulence boundaries—Turbulence in a stably stratified fluid heodorsen's horseshoes in boundary layer spaghetti orced and free convection—Clear air turbulence in et stream | 114 |
| 7 | | | 143 |
| | vecti | on—Thermals in the atmosphere—Natural exploita- of atmospheric thermals | |
| 8 | PLUI | MES AND JETS | 186 |
| | Transmood wind —Eff beha | ejets, or momentum plumes—Pure buoyant plumes—nsition from a jet to a buoyant plume—Jet in a oth crosswind—Buoyant plume in a smooth cross-l—Plumes in turbulent crosswinds—Sutton's theory fective stack height—Diurnal variations in plume viour—The behaviour of a plume near the orifice numes as natural phenomena | |
| , | AIR | Waves | 218 |
| | -M | osion waves—Tidal waves; the theory of resonance ountain waves—Travelling waves—Waves produced hermals—Noise in Nature | |
| 10 | CLO | UDS AND FALLOUT | 256 |
| | ment | energy of water—Convection in a stable environ- t—The transformation of thin layer clouds— out—Tides in the atmosphere—Thunderstorms | |
| 11 | The of d —Di meth dispe | mathematician's method—Physics: the method imensional coefficients—The geographer's method imensional analysis: numerical coefficients—The nod of small perturbations—Formulae for plume ersion: the dangers of extra-polation—The sense question | 282 |
| | Proi | BLEMS AND EXPERIMENTS FOR DISCUSSION | 301 |
| | INDI | EX | 308 |