

Contents

Introduction 1

1 Mathematics, Mysticism, and More

From Pythagoras and Plato to Pauli 7

2 Mass in Motion

Kepler, Newton and Kelvin lay the foundations 25

3 From Engines to Entropy

Carnot and Clausius develop the yardstick of engine efficiency 41

4 From Statistical Entropy to Statistical Time

Thermodynamics evolves from being an engineer's coal pit to becoming a philosopher's gold mine 55

5 Maxwells's Demon and Szilard's One Atom Engine

A heady mixture of entropy, information and consciousness 65

6 Quantum Mechanics I

From magnets to masers 75

7 Using Quantum Mechanics to Resolve the Maxwell Demon Paradox

Solving the demon problem with quantum mechanics but without information science, sweat or tears 93

8 Quantum Mechanics II

The wave side of particles and the particle side of waves 105

The Demon and the Quantum, Second Edition. Robert J. Scully and Marlan O. Scully
Copyright © 2010 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim
ISBN 978-3-527-40983-9

VII

9 From Wigner's Friend to Quantum Eraser
Of Wigner's friends and their amnesia 121

10 On Quantum Mechanics and the Big Questions
*From quantum controversy to Pauli's spiritual
complementarity* 137

Endnotes 165

Acknowledgements 243

Glossary 245

Citations, Comments and Further Readings 253

Index 259