## **Contents**

1	Adolescent Years and the Principle of Least Action		
	1.1	Childhood, High School and MIT	3
	1.2	Light Saves as Much Time as It Can: Fermat's Principle	24
	1.3	•	
		Action	34
2	Princeton, Path Integrals, and the Manhattan Project		
	2.1	Feynman in Princeton	43
	2.2	Electrodynamics Without Fields	48
	2.3	The Action in Quantum Mechanics	64
	2.4	Radioactivity and the Manhattan Project	72
3	Feynman's Path to Quantum Electrodynamics		91
	3.1	Going to Cornell	91
	3.2	The Masterpiece: Feynman Diagrams and Antiparticles	103
	3.3	Lamb Shift, Magnetic Moment and Renormalization	121
	3.4	Schwinger, Tomonaga, and Dyson	137
4	California, Super-Cold Helium, and the Weak Interaction		151
	4.1	Brazil and the Move to Caltech	151
	4.2	Physics at Low Temperatures	161
	4.3	Right and Left: The Violation of Mirror Symmetry	182
5	From Researcher to Teacher and Nobel Prizewinner		
	5.1	Marriage, Family, and the Nobel Prize	206



xii		Contents	
	5.2	Nanotechnology: There's Plenty of Room at the Bottom	209
	5.3	The Feynman Lectures	219
	5.4	Gravity and Quantum Theory	235
6	Quarks, Computers, and the Challenger Disaster		249
	6.1	Symmetries and Quarks	250
	6.2	Computers	267
	6.3	The Last Years and the Challenger Disaster	286
	6.4	Feynman's Legacy	298
Glossary			305
So	Sources and Literature		