## Contents

		Introduction	1		
PART ONE THE BIRTH OF MOLECULAR BIOLOGY					
	1	The Roots of the New Science	13		
	2	The One Gene-One Enzyme Hypothesis	23		
	3	The Chemical Nature of the Gene	32		
	4	The Phage Group	41		
	5	The Birth of Bacterial Genetics	52		
	6	The Crystallization of the Tobacco Mosaic Virus	63		
	7	Enter the Physicists	67		
	8	The Influence of the Rockefeller Foundation	79		
	9	Physical Techniques in Molecular Biology	88		
	10	The Role of Physics	99		
ı	PA	RT TWO THE DEVELOPMENT OF MOLECULAR BIOLOGY			
	11	The Discovery of the Double Helix	105		
	12	Deciphering the Genetic Code	120		
	13	The Discovery of Messenger RNA	138		
	14	The French School	148		

vi Contents

PA	RT THREE THE EXPANSION OF MOLECULAR BIOLOGY	
15	Normal Science	165
16	Genetic Engineering	179
17	Split Genes and Splicing	200
18	The Discovery of Oncogenes	211
19	From DNA Polymerase to the Amplification of DNA	222
PA	RT FOUR BEYOND MOLECULAR BIOLOGY?	
20	The Molecularization of Biology and Medicine	235
21	Protein Structure	251
22	The Rise of Developmental Biology	263
23	Molecular Biology and Evolution	278
24	Gene Therapy	297
25	The Central Place of RNA	311
26	Epigenetics	325
27	Sequencing the Human Genome	340
28	Systems Biology and Synthetic Biology	355
29	Images, Representations, and Metaphors in Molecular Biology	369
	General Conclusion	385
	Appendix: Definition of Terms	389
	Notes	393
	Index	503