

CONTENTS

CHAPTER	PAGE
PREFACE	v
INTRODUCTION	ix
PART I · THE CLASSICAL PICTURE OF THE PHYSICAL WORLD	
I. THE GENERAL CHARACTER OF CLASSICAL PHYSICS	3
II. THE CONCEPT OF SPACE	7
The Substantiality and Immutability of Space . . .	
The Homogeneity of Space and Its Consequences	
. . . The "Theme of Gulliver" and the Relativity	
of Magnitude . . . The Euclidean Character of	
Space and Its Three-Dimensionality . . . The Causal	
Inertness of Space	
III. THE CONCEPT OF TIME	35
The Independence of Time from Its Physical Content . . .	
The Homogeneity of Time and Its Consequences . . .	
The Relativity of Temporal Intervals . . . The Uniform Fluidity and the Causal	
Inertness of Time . . . The Problem of the Duration of Space	
IV. THE CONCEPT OF MATTER	54
The Classical Definition of Matter and Its Consequences . . .	
The Constancy of Matter . . . Atomicity Is Underivable from the Basic Definition of	
Matter	
V. THE CONCEPT OF MOTION	67
Motion and the Concepts of Space, Time, and Matter . . .	
The Substantiality of Motion and the Laws of Conservation	
VI. THE MAIN FEATURES OF THE CORPUSCULAR-KINETIC VIEW OF NATURE	79
The Unity of Matter . . . The Elimination of Action at a Distance	

VII.	SOME COLLATERAL TRENDS: DYNAMISM, ENERGETISM, FLUID THEORIES	92
	Dynamism . . . Energetism . . . Fluid Theories of Matter	
VIII.	THE IMPLICIT ELIMINATION OF TIME IN CLASSICAL PHYSICS	121
	The Laplacian Timeless Formula . . . The Reversibility of Classical Time	
IX.	THE ULTIMATE CONSEQUENCES OF MECHANISM	135
PART II · THE DISINTEGRATION OF THE CLASSICAL FRAMEWORK AND THE SIGNIFICANCE OF NEW CONCEPTS		
X.	THE NEGATION OF INSTANTANEOUS SPACE	143
	The Search for Absolute Motion . . . Relativity of Simultaneity	
XI.	THE FUSION OF SPACE WITH TIME AND ITS MISREPRE- SENTATION	158
	The Fallacy of Spatialization . . . The Irreversibility of the Causal Links and Relativity of Juxtaposition . . . Dynamization of Space in the General Theory	
XII.	THE MODIFICATION OF THE CONCEPT OF TIME	188
	Recapitulation . . . The Meaning of the Dilatation of Time in the Special Theory . . . The Meaning of the Dilatation of Time in the General Theory . . . In What Sense Time Remains Universal	
XIII.	THE DYNAMIC STRUCTURE OF TIME-SPACE	214
	The Problem of the Contemporary World and the New Meaning of Spatiality . . . Doubts about Spatiotemporal Continuity . . . Pulsational Time- Space	
XIV.	THE EVOLUTION OF THE CONCEPT OF MATTER	244
	The Inadequacy of Corpuscular Models . . . The Fusion of Mass with Energy	
XV.	THE TRANSFORMATION OF THE CONCEPT OF MOTION ..	262

Contents

ix

“Changes” Supersede “Displacements” . . . Events
Replace Particles

XVI.	THE END OF THE LAPLACIAN ILLUSION	289
	The Principle of Indeterminacy and Its Conflicting Interpretations . . . The Contingency of Micro- physical Events . . . The Inadequacy of the Quan- titative View of Nature	
XVII.	THE REINSTATEMENT OF BECOMING IN THE PHYSICAL World	333
	The Emergence of Novelty and the Potentiality of the Future . . . Novelty Is Compatible with the Causal Influence of the Past . . . Novelty Implies Irreversibility	
XVIII.	IN SEARCH OF NEW WAYS OF UNDERSTANDING	361
XIX.	SUMMARY	382
	INDEX	400