TABLE OF CONTENTS

FOREWO)R	D
--------	----	---

.

PART I UNITS OF SCIENTIFIC KNOWLEDGE AND KNOWLEDGE ACQUISITION

INT	RODUCTION	3
RES	EARCH PROGRAMS AND RESEARCH STRATEGIES	5
1.1	Research programs	5
1.2	Research strategies	23
OBSERVATIONAL LAWS AND PROPER THEORIES		37
2.1	Examples and <i>prima facie</i> characteristics	40
2.2	Theory-relative explications	44
2.3	Theory-ladenness of observation	52
2.4	The structure of proper theories and the main epistemological	
	positions	56
Арр	endix 1: The ideal gas law	64
Appendix 2: The empirical basis		
	INT RES 1.1 1.2 OBS 2.1 2.2 2.3 2.4 App App	 INTRODUCTION RESEARCH PROGRAMS AND RESEARCH STRATEGIES Research programs Research strategies OBSERVATIONAL LAWS AND PROPER THEORIES Examples and <i>prima facie</i> characteristics Theory-relative explications Theory-ladenness of observation The structure of proper theories and the main epistemological positions Appendix 1: The ideal gas law Appendix 2: The empirical basis

PART II PATTERNS OF EXPLANATION AND DESCRIPTION

	INTRODU	JCTION	73
3	EXPLANA	ATION AND REDUCTION OF LAWS	75
	3.1 Exan	nples of explanations of observational laws	77
	3.2 A de	composition model for the explanation of laws	86
	3.3 Redu	action of laws by theories	89
4	EXPLANATION AND DESCRIPTION BY SPECIFICATION		97
	4.1 Inten	tional explanation of actions, goals and choices	98
	4.2 Func	tional explanation of biological traits	113
	4.3 Spec	ific causal explanations	123
	4.4 Extra	apolations and speculations	126

133

PART III STRUCTURES IN INTERLEVEL AND INTERFIELD RESEARCH

INTRODUCTION

RED	DUCTION AND CORRELATION OF CONCEPTS	135
5.1	Type-type identities and correlations	135
5.2	Analysis of reduction and correlation of concepts	138
5.3	The relation between concept and law reduction, multiple concept	
	reduction, and (non-)reductionistic strategies	153
LEVELS, STYLES, AND MIND-BODY RESEARCH		
6.1	Interlevel and interfield research	159
6.2	Explication of the relations between the styles	167
6.3	Biophysical mind-body interlevel research	175
6.4	Interlevel and interstyle mind-body research	183
6.5	Lateral interfield research	194
	RED 5.1 5.2 5.3 LEV 6.1 6.2 6.3 6.4 6.5	 REDUCTION AND CORRELATION OF CONCEPTS 5.1 Type-type identities and correlations 5.2 Analysis of reduction and correlation of concepts 5.3 The relation between concept and law reduction, multiple concept reduction, and (non-)reductionistic strategies LEVELS, STYLES, AND MIND-BODY RESEARCH 6.1 Interlevel and interfield research 6.2 Explication of the relations between the styles 6.3 Biophysical mind-body interlevel research 6.4 Interlevel and interstyle mind-body research 6.5 Lateral interfield research

PART IV CONFIRMATION AND EMPIRICAL PROGRESS

	INT	RODUCTION	199
7	TES	TING AND FURTHER SEPARATE EVALUATION OF	
	THE	EORIES	201
	7.1	Falsification and confirmation by the HD-method	203
	7.2	Separate HD-evaluation of a theory	213
	7.3	Falsifying general hypotheses, statistical test implications, and	
		complicating factors	221
8	EMI	PIRICAL PROGRESS AND PSEUDOSCIENCE	229
	8.1	Comparative HD-evaluation of theories	229
	8.2	Evaluation and falsification in the light of truth approximation	238
	8.3	Scientific and pseudoscientific dogmatism	243

PART V TRUTH, PRODUCT, AND CONCEPT APPROXIMATION

	INTRODUCTION	253
9	PROGRESS IN NOMOLOGICAL, EXPLICATIVE AND DESIGN	255
	9.1 Formal progress in nomological research	256

		TABLE OF CONTENTS	vii
	9.2	Empirical progress and nomological research programs	260
	9.3	Progress in design and explicative research	262
10	DES	GN RESEARCH PROGRAMS	265
	10.1	The lattice model	266
	10.2	The naive model of problem states and transitions	268
	10.3	Structural versus functional properties	273
	10.4	Potential applications and realizations	276
	10.5	Potentially relevant properties	280
	10.6	Resemblance and differences with truth approximation	281

PART VI CAPITA SELECTA

	INTRODUCTION	287	
11	COMPUTATIONAL PHILOSOPHY OF SCIENCE	289	
	11.1 Impressions about programs	290	
	11.2 Computational theory selection and the evaluation matrix	304	
12	THE STRUCTURALIST APPROACH TO THEORIES	317	
	12.1 Why the structuralist approach?	318	
	12.2 The epistemologically unstratified approach to theories	320	
	12.3 The stratified approach to theories	324	
	12.4 Refinements	333	
13	'DEFAULT-NORMS' IN RESEARCH ETHICS		
	13.1 Merton's norms conceived as 'default-norms'	344	
	13.2 Disinterestedness, and its challenges	348	
	SUGGESTIONS FOR FURTHER READING	357	
	EXERCISES	361	
	NOTES		
	REFERENCES		
	INDEX OF NAMES		
	INDEX OF SUBJECTS	393	