

TABLE OF CONTENTS

FOREWORD	ix
CHAPTER 1: GENERAL INTRODUCTION: EPISTEMOLOGICAL POSITIONS	1
1.1. Four perspectives on theories	1
1.2. The four main epistemological questions	3
1.3. The main epistemological and methodological claims	8
1.4. Preliminaries and a survey of cognitive structures	10
PART I: CONFIRMATION	
INTRODUCTION TO PART I	
	15
CHAPTER 2: CONFIRMATION BY THE HD-METHOD	17
2.1. A qualitative theory of deductive confirmation	21
2.2. Ravens, emeralds, and other problems and solutions	27
2.3. Acceptance of hypotheses	38
CHAPTER 3: QUANTITATIVE CONFIRMATION, AND ITS QUALITATIVE CONSEQUENCES	43
3.1. Quantitative confirmation	44
3.2. Qualitative consequences	55
3.3. Acceptance criteria	65
Appendix 1: Corroboration as inclusive and impure confirmation	68
Appendix 2: Comparison with standard analysis of the raven paradox	70
CHAPTER 4: INDUCTIVE CONFIRMATION AND INDUCTIVE LOGIC	73
4.1. Inductive confirmation	74
4.2. The continuum of inductive systems	77
4.3. Optimum inductive systems	79
4.4. Inductive analogy by similarity and proximity	80
4.5. Universal generalizations	83

PART II: EMPIRICAL PROGRESS

INTRODUCTION TO PART II	91
CHAPTER 5: SEPARATE EVALUATION OF THEORIES BY THE HD-METHOD	93
5.1. HD-evaluation of a theory	95
5.2. Falsifying general hypotheses, statistical test implications, and complicating factors	103
CHAPTER 6: EMPIRICAL PROGRESS AND PSEUDOSCIENCE	111
6.1. Comparative HD-evaluation of theories	111
6.2. Evaluation and falsification in the light of truth approximation	120
6.3. Scientific and pseudoscientific dogmatism	126

PART III: BASIC TRUTH APPROXIMATION

INTRODUCTION TO PART III	137
CHAPTER 7: TRUTHLIKENESS AND TRUTH APPROXIMATION	139
7.1. Actual truthlikeness	142
7.2. Nomic truthlikeness	146
7.3. Actual and nomic truth approximation	154
7.4. Survey of bifurcations	165
7.5. Novel facts, crucial experiments, inference to the best explanation, and descriptive research programs	166
CHAPTER 8: INTUITIONS OF SCIENTISTS AND PHILOSOPHERS	173
8.1. Conceptual foundations of nomic truth approximation	173
8.2. Truthlikeness and the correspondence theory of truth	190
8.3. Explicating dialectical concepts	198
CHAPTER 9: EPISTEMOLOGICAL STRATIFICATION OF NOMIC TRUTH APPROXIMATION	208
9.1. Theoretical and substantial nomic truth approximation	209
9.2. Referential truth approximation	219
9.3. Rules of inference, speculations, extensions, and explanatory research programs	228
9.4. Epistemological positions reconsidered	236

PART IV: REFINED TRUTH APPROXIMATION

INTRODUCTION TO PART IV	243
CHAPTER 10: REFINEMENT OF NOMIC TRUTH APPROXIMATION	245
10.1. Structurelikeness	246
10.2. Refined nomic truthlikeness and truth approximation	249
10.3. Foundations of refined nomic truth approximation	262
10.4. Application: idealization & concretization	268
10.5. Stratified refined nomic truth approximation	272
CHAPTER 11: EXAMPLES OF POTENTIAL TRUTH APPROXIMATION	278
11.1. The old quantum theory	278
11.2. Capital structure theory	288
CHAPTER 12: QUANTITATIVE TRUTHLIKENESS AND TRUTH APPROXIMATION	299
12.1. Quantitative actual truthlikeness and truth approximation	301
12.2. Quantitative nomic truthlikeness	302
12.3. Quantitative nomic truth approximation	308
CHAPTER 13: CONCLUSION: CONSTRUCTIVE REALISM	317
13.1. Main conclusions	317
13.2. Three types of induction	320
13.3. Formation of observation terms	322
13.4. Direct applicability of terms	324
13.5. The metaphysical nature of scientific research	325
13.6. Portraits of real and fictitious scientists	327
13.7. Reference and ontology	329
13.8. Truth definitions and truth criteria	330
13.9. Metaphors	331
NOTES	334
REFERENCES	347
INDEX OF NAMES	355
INDEX OF SUBJECTS	359