## **Contents**

| Pretace  | V          |
|--|------------|
| I. PROBABILITY AND INDUCTION   |            |
| I. I. Introduction   | 1          |
| I. 2. Arguments  | 1          |
| I. 3. Logic  | 4          |
| I. 4. Inductive Versus Deductive Logic                                 | 6          |
| I. 5. The General and the Specific                                     | 13         |
| I. 6. Epistemic Probability  | 15         |
| I. 7. Probability and the Problems of Inductive Logic                  | 20         |
| II. THE TRADITIONAL PROBLEM OF INDUCTION                               |            |
| II. 1. Introduction  | 24         |
| II. 2. Hume's Argument   | 24         |
| II. 3. The Inductive Justification of Induction                        | 30         |
| II. 4. The Pragmatic Justification of Induction                        | 41         |
| II. 5. An Attempted Dissolution of the Traditional Problem             |            |
| of Induction   | 47         |
| II. 6. Summary   | 54         |
| III. THE GOODMAN PARADOX AND THE NEW RIDDLE OF INDUCTION               |            |
| III. 1. Introduction   | <b>56</b>  |
| III. 2. Regularities and Projection                                    | 57         |
| III. 3. The Goodman Paradox  | 61         |
| III. 4. The Goodman Paradox, Regularity, and the Principle             |            |
| of the Uniformity of Nature  | 65         |
| III. 5. Summary  | 73         |
| IV. MILL'S METHODS OF EXPERIMENTAL INQUIRY AND THE NATURE OF CAUSALITY |            |
| IV. 1. Introduction  | 75         |
| IV. 2. The Structure of Simple Statements                              | <b>7</b> 5 |
| IV. 3. The Structure of Complex Statements                             | 77         |
| IV. 4. Simple and Complex Properties                                   | 82         |
| IV. 5. Causality and Necessary and Sufficient Conditions               | 84         |

vi CONTENTS

| IV. 6. Mill's Methods  | 88  |
|--|-----|
| IV. 7. The Direct Method of Agreement                        | 89  |
| IV. 8. The Inverse Method of Agreement                       | 95  |
| IV. 9. The Method of Difference                              | 101 |
| IV.10. The Combined Methods                                  | 106 |
| IV.11. The Application of Mill's Methods                     | 111 |
| IV.12. Sufficient Conditions and Functional Relationships    | 115 |
| IV.13. Lawlike and Accidental Conditions                     | 120 |
| V. THE PROBABILITY CALCULUS                                  |     |
| V. 1. Introduction   | 129 |
| V. 2. Probability, Arguments, Statements, and Properties     | 129 |
| V. 3. Disjunction and Negation Rules                         | 132 |
| V. 4. Conjunction Rules and Conditional Probability          | 138 |
| V. 5. Expected Value of a Gamble                             | 148 |
| V. 6. Gambling and the Probability Calculus                  | 152 |
| V. 7. Bayes' Theorem   | 153 |
| V. 8. Probability and Causality                              | 156 |
| Appendix to Chapter V: SAMPLING AND STATISTICS               |     |
| A. 1. Introduction   | 159 |
| A. 2. Descriptive Statistics                                 | 159 |
| A. 3. Sampling and Projective Statistics                     | 162 |
| VI. COHERENCE  |     |
| VI. 1. Introduction  | 167 |
| VI. 2. The Probability Calculus in a Nutshell                | 167 |
| VI. 3. The Logical Consequence Principle Alone Is Not Enough | 171 |
| VI. 4. Bets  | 175 |
| VI. 5. Fair Bets   | 178 |
| VI. 6. The Dutch Book  | 185 |
| VI. 7. Conditionalization                                    | 189 |
| VI. 8. Fallibility   | 194 |
| VI. 9. Utility   | 198 |
| VI.10. Ramsey  | 202 |
| VII. KINDS OF PROBABILITY                                    |     |
| VII. 1. Introduction   | 205 |
| VII. 2. Rational Degree of Belief                            | 205 |
| VII. 3. Relative Frequency                                   | 208 |
| VII. 4. Chance   | 211 |
| Index  | 217 |