

Contents

| | |
|---|-----------|
| <i>Series Editor's Foreword</i> | x |
| Introduction | 1 |
| I.1 Preliminaries and outline of project | 1 |
| 1 The Concept of Idealization | 11 |
| 1.1 Idealization and the sciences | 11 |
| 1.2 The function of idealization | 14 |
| 1.3 Truth and idealization | 17 |
| 1.4 Idealization and simplification | 19 |
| 1.5 Model/world complexity and simplicity | 21 |
| 1.6 Idealization and representation | 24 |
| 1.7 The 'is an idealization of' relation | 26 |
| 1.8 Admissible idealizing assumptions | 26 |
| 1.9 More on the representational nature of idealization | 27 |
| 1.10 Basic terminology | 29 |
| 1.11 Prediction, explanation, and idealization | 30 |
| 1.12 Theoretical idealizations | 32 |
| 1.13 Non-constructive idealizations | 35 |
| 1.14 Constructive idealizations | 40 |
| 1.15 Non-theoretical idealizations | 41 |
| 2 The Ubiquity of Idealization and Its Logic | 47 |
| 2.1 Introduction | 47 |
| 2.2 Cartwright's anti-realism and the ubiquity of idealizing assumptions | 49 |
| 2.3 The ineliminability of idealizations thesis | 52 |
| 2.4 An aside on the use of the terms 'idealization' and 'abstraction' | 54 |
| 2.5 The ubiquity thesis and the logic of idealization | 56 |
| 2.6 The strong ubiquity thesis and the weak ubiquity thesis | 58 |
| 2.7 A problem for scientific realism | 60 |
| 2.8 More on the idealization-based attacks on realism | 62 |
| 2.9 Ubiquity, eliminability, and representation | 63 |
| 2.10 The virtues of simplicity and the nature of theoretical claims | 64 |

| | | |
|----------|--|------------|
| 2.11 | Nowak's objection | 69 |
| 2.12 | Idealization and counterfactuals | 81 |
| 2.13 | The rightness of counterfactuals and idealizing counterfactuals | 83 |
| 2.14 | The logic of idealization: VI | 86 |
| 2.15 | The completeness of possible worlds | 89 |
| 2.16 | The idealization relation | 90 |
| 2.17 | Why accept VI as the logic of idealization? | 95 |
| 3 | Epistemic Access, Confirmation, and Idealization | 101 |
| 3.1 | Confirmation, idealization, and the epistemic access problem | 101 |
| 3.2 | The ubiquity thesis and <i>de facto</i> confirmation | 105 |
| 3.3 | Hypothetico-deductivism | 109 |
| 3.4 | The instance theory of confirmation and Hempel's theory of confirmation | 111 |
| 3.5 | Frequencies of idealized events | 113 |
| 3.6 | Probabilities and confirming idealizing counterfactuals | 115 |
| 3.7 | Bayesianism and idealizing counterfactuals | 116 |
| 3.8 | The basics of Bayesian confirmation theory | 117 |
| 3.9 | A problem for Bayesian confirmation theory | 122 |
| 3.10 | Prospects for a solution to the Bayesian problem of idealization | 124 |
| 3.11 | Lewis' concept of imaging | 125 |
| 3.12 | The AGM/Levi approach to conditionals | 127 |
| 3.13 | Bennett's hybrid view | 131 |
| 3.14 | Jones' defense of Bayesianism | 133 |
| 3.15 | A Nowakian response | 137 |
| 3.16 | Provisional conclusions and prognoses | 139 |
| 4 | Idealization, Inference to the Best Explanation, and Scientific Realism | 145 |
| 4.1 | Idealization and inference to the best explanation | 145 |
| 4.2 | Desiderata for a theory of inference to the best explanation | 146 |
| 4.3 | What is an explanation? | 147 |
| 4.4 | The best answers to why-questions | 149 |
| 4.5 | Contextualism and degrees of explanatoriness | 149 |
| 4.6 | A formal account of inference to the best explanation | 155 |
| 4.7 | What it takes (minimally) to be an explanation | 157 |

| | | |
|------|--|-----|
| 4.8 | The contextual aspects of explanation | 159 |
| 4.9 | When are we justified in claiming that something has been explained? | 160 |
| 4.10 | The probative nature of inference to the best explanation, likelihoods, and the acceptance of theories | 163 |
| 4.11 | Further norms, evidence, and the variety of explanatory practices | 167 |
| 4.12 | Answering the explanatory regress argument and the argument from unconfirmability | 171 |
| 4.13 | Refuting the argument from misrepresentation | 173 |
| 4.14 | Scientific realism and its varieties | 176 |
| 4.15 | Realisms | 178 |
| 4.16 | The ontological status of idealized models/worlds | 185 |
| 4.17 | The realism/anti-realism debate and the many aims of science | 187 |

| | |
|-------------------|-----|
| <i>References</i> | 194 |
|-------------------|-----|

| | |
|--------------|-----|
| <i>Index</i> | 207 |
|--------------|-----|