Contents

PART ONE

I. Paradox

Brains in Vats • Dreams and Evil Geniuses • Ambiguity • Is Anything Certain? • Deduction and Induction • Confirmation Theory • Paradox • Science as a Map • Paradox and SATISFIABILITY • The Universal Problem

2. Induction: Hempel's Raven

Confirmation • Matter and Antimatter • Absolute and Incremental Confirmation • Counterexamples • Crank Theories • Contrapositives • Never Say Never • Stream of Consciousness • Infinitesimal Confirmation • The Paradox of the 99-Foot Man • Ravens and Total Evidence

3. Categories: The Grue-Bleen Paradox

Grue Emeralds • Gerrymander Categories • Counterfactuals • The Rotating Color Wheel • The Inverted Spectrum • Demon Theory No. 16 • Anything Confirms Anything • Ockam's Razor • The Day of Judgment • Projectability • Are Quark Colors Grue-ish?

4. The Unknowable: Nocturnal Doubling

Antirealism • Physics Goes Haywire • Demons and Doubling • Variations • Did Time Begin Five Minutes Ago? • Perils of 3

24

44

59

viii CONTENTS

Antirealism • Black-Hole Probes • Other Minds • Nocturnal Doubling of Pleasure/Pain • Is Reality Unique?

PART TWO

Interlude: The Puzzles of John H. Watson, M.D.

A Test of Ingenuity • Gas, Water, and Electricity • The Company Grapevine • The Graveyard Riddle • A Surveyor's Quandary • Solutions

5. Deduction: The Paradox of the Heap

Theseus' Ship • Sorites • Complexity • Liars and Truth Tellers • Who Is Lying? • SATISFIABILITY • The Pork-Chop Problem

• The Elevator Problem • Science and Puzzles

6. Belief: The Unexpected Hanging

Pop Quizzes and Hidden Eggs • Hollis's Paradox • A Minimal Paradox • A Time-Travel Paradox • What Is Knowledge? • Science and the Tripartite Account • Buridan Sentences • Gettier Counterexamples • A Fourth Condition • The Prisoner and Gettier

7. The Impossible: The Expectancy Paradox

Catch-22 · Can Such Things Be? · Possible Worlds · How Many Worlds Are Possible? • Paradox and Possible Worlds • The Paradox of the Preface • Must Justified Beliefs Be Compatible? • Pollock's Gas Chamber

8. Infinity: The Thomson Lamp

The Pi Machine • Zeno's Paradoxes • Building a Thomson Lamp · Geometric Progressions · The Malthusian Catastrophe • Olbers's Paradox • Against Plurality • Olbers's Paradox Resolved • The Paradox of Tristram Shandy

9. NP-Completeness: The Labyrinth of Ts'ui Pên

NP-Complete • Maze Algorithms • The Right-Hand Rule • The Trémaux Algorithm • An Infinite Labyrinth • The Ore Algorithm • NP-Completeness of the Maze • The Oracle of the Maze • P and NP • The Hardest Problem • A Catalogue of Experience • A Computer as Big as the Universe

143

160

110

93

81

126

CONTENTS ix

PART THREE

10. Meaning: Twin Earth

Roger Bacon • False Decodings • Sense and Gibberish • The Parable of the Cave • The Electronic Cave • The Binary Cave • Can a Brain in a Vat Know It? • Twin Earth • Twin Earth Chemistry • The Libraries of Atlantis • Poe's iiiii . . . Cipher • Brute Force • Justifying a Decipherment • Where Is Meaning?

II. Mind: Searle's Chinese Room

The Thinking Machine • The Paradox of Functionalism • The Turing Test • The Chinese Room • Brains and Milk • Reactions • Chinese the Hard Way • Dr. Jekyll and Mr. Hyde • The Systems Reply • A Page from the Instructions • A Conversation with Einstein's Brain

12. Omniscience: Newcomb's Paradox

The Paradox of Omniscience • The Prisoner's Dilemma • Newcomb's Paradox • Reactions • Glass Boxes • Nozick's Two Principles of Choice • Must It Be a Hoax? • Two Types of Prediction • Chaos • Free Will vs. Determinism • Prediction and Infinite Regress • Newcomb's Paradox 3000 A.D.

Bibliography

Index

269

265

222

239