

CONTENTS

Acknowledgements	vii	
Chapter 1	Introduction: Chemistry and Its Discontents	1
	The Philosophy of Chemistry	2
	The Image of Chemistry	4
	The Goals of the Book	5
	The Structure of the Book	6
Chapter 2	Chemistry and Pollution	11
	Chemical versus Natural	11
	Chemistry in Literature	15
	Silent Spring	17
	“Better Things for Better Living ... Through Chemistry”	21
	Abundance and Waste	27
	Courting Disaster	29
	Artificial or Natural?	30
Chapter 3	The Damnation of the Alchemist	33
	Magicians or Charlatans	33
	In Defense of Artifice	37
	Faustian Ambitions	39
	From Extracts to Ersatz	42
	Pure and Applied Chemistry	45
	Artefacts as Hybrids of Nature and Society	46

Chapter 4	The Space of the Laboratory	55
	Chemical Recipe Books	58
	A Space of Toil	63
	Seeing at a Glance	65
	A Purified Space	68
	A Social Space	72
	An Instrumental Space	74
Chapter 5	Proof in the Laboratory	81
	Chemical Experiment as Public Spectacle	81
	Instruments of Decision	84
	The Power of Scepticism	87
	The Price of Proof	89
	The Limits of Proof	93
Chapter 6	Chemistry Creates Its Object	99
	The Different Meanings of Synthesis	101
	From Simple to Complex	102
	From Fictions to Artefacts	105
	A Creative Process	109
Chapter 7	A Duel between Two Conceptions of Matter	115
	The Ancient Concept of <i>Phusis</i>	115
	Atoms versus Elements; Two Rival Systems	117
	Is Chemistry Aristotelian?	120
	The Aporia of the Mixt	122
	Mixts or Compounds, Stahl or Lavoisier	123
	A Vexing Question	125
Chapter 8	Chemistry versus Physics	131
	To Each Science Its Ontology	132
	The Ultimate Quest	137
	No Matter Without Qualities	139
	No Matter Without Agency	145

Chapter 9	Atoms or Elements	155
	Mendeleev's Wager	156
	Renewing Mendeleev's Wager	161
	Who's Afraid of Reductionism?	164
	Between the Macro and the Micro	168
Chapter 10	Positivism and Chemistry	175
	A Variety of Positivisms	176
	Chemistry as the Model for Positive Science	177
	Positivism as an Obstacle?	179
	Positivism versus Realism	181
Chapter 11	Atoms as Fictions	185
	Writing Formulae	186
	Types and Models	187
	Agnostic Atomism	189
	Atoms as Mediators	191
	The Phenomenalist Response	193
	The Instrumentalist Response	194
	The Energetist Response	197
Chapter 12	Agency and Relations	201
	Elements as Actors	202
	Operational Realism	206
	Alternative Metaphors	210
Chapter 13	Taming the Nanoworld	215
	Bottom-Up versus Top-Down	217
	Rational Design	219
	Bio-Inspired Chemistry	221
	The Return of Chemistry's Faustian Ambitions	225
	The Rise of Chemistry's Philosophical Ambitions	226

Chapter 14	Towards a Responsible Chemistry	231
	Concerns About the Future	231
	The Chemist's Code of Conduct	233
	From Prudence to Precaution	236
	A New Chemical Culture?	238
Bibliography		245
Index		263