

CONTENTS

FOREWORD		x
PREFACE		xii
A NOTE ON LANGUAGE		xviii
<i>Chapter 1</i>		
OVERSHOOT		1
<i>Chapter 2</i>		
THE DRIVING FORCE: EXPONENTIAL GROWTH		14
The Mathematics of Exponential Growth		15
Things That Grow Exponentially		20
World Population Growth		23
World Industrial Growth		33
More Poverty, More People, More Poverty		37

Chapter 3

THE LIMITS: SOURCES AND SINKS	44
Renewable Resources	47
Nonrenewable Resources	66
Sinks for Pollution and Wastes	86
Beyond the Limits to Throughput	97

Chapter 4

THE DYNAMICS OF GROWTH IN A FINITE WORLD	104
The Purpose and Structure of World3	105
Limits and No Limits	115
Limits and Delays	120
Overshoot and Collapse	128
World3: Two Possible Scenarios	130
Why Overshoot and Collapse?	137

Chapter 5

BACK FROM BEYOND THE LIMITS: THE OZONE STORY	141
The Growth	142
The Limit	144
The First Signals	147
The First Response	149
Erosion: The Ozone Hole	150
The Next Response	154
Getting Along without CFCs	157
The Moral of the Story?	159

Chapter 6

TECHNOLOGY, MARKETS, AND OVERSHOOT	161
Technology and Markets in the "Real World"	163
Stretching the Limits with Technology in World3	167
Why Technology and Markets Alone Can't Avoid Overshoot	179
Technology, Markets, and the Destruction of Fisheries	185
A Summary	188

<i>Chapter 7</i>	
TRANSITIONS TO A SUSTAINABLE SYSTEM	190
Deliberate Constraints on Growth	193
Constraints on Growth plus Improved Technologies	198
The Difference Twenty Years Can Make	201
How High Is Too High?	204
The Sustainable Society	209
<i>Chapter 8</i>	
OVERSHOOT BUT NOT COLLAPSE	218
The First Two Revolutions: Agriculture and Industry	219
The Next Revolution: Sustainability	222
Visioning	224
Networking	227
Truth-telling	228
Learning	231
Loving	233
APPENDIX	
Research and Teaching with World3	237
ENDNOTES	254
ANNOTATED BIBLIOGRAPHY	267
GLOSSARY OF SYSTEMS TERMS	275
LIST OF TABLES AND FIGURES WITH SOURCES	280
INDEX	292