

Contents

	<i>Preface</i>	page xi
	<i>Glossary</i>	xiii
1	Plants Are Strange and Wondrous Beings	1
	1.1 Introduction	1
	1.2 The Nature of Land Plants	3
	1.3 Reaction	7
	1.4 Niche and Guild	10
	1.5 The Accession of Species into Mixtures	18
	1.6 Conclusions	22
2	Interactions between Species	24
	2.1 Introduction	24
	2.2 Interference: Negative Effects between Plants	24
	2.3 Facilitation: Positive Effects between Plants	34
	2.4 Litter: The Necessary Product	39
	2.5 Autogenic Disturbance: Plants As Disturbers	48
	2.6 Parasitism	52
	2.7 Plant-Plant Interactions Mediated by Heterotrophs	52
	2.8 Combined Effects	62
	2.9 Conclusions	63
3	Mechanisms of Coexistence	66
	3.1 Introduction	66
	3.2 Alpha-Niche Differentiation	69
	3.3 Environmental Fluctuation (Hourly to Decadal Change)	72
	3.4 Pest Pressure (Heterotroph Challenges)	76
	3.5 Circular Interference Networks	82
	3.6 Allogenic Disturbance (Disrupting Growth, Mainly Mechanically)	89
	3.7 Interference/Dispersal Tradeoff	93
	3.8 Initial Patch Composition	94
	3.9 Cyclic Succession: Movement of Community Phases	95

3.10	Equal Chance: Neutrality	95
3.11	Spatial Mass Effect	97
3.12	Inertia	98
3.13	Coevolution of Interference Ability	100
3.14	Conclusions	102
4	Community-Level Processes	105
4.1	Introduction	105
4.2	Allogenic Change	105
4.3	Succession-towards-Climax	109
4.4	Cyclic Succession: Fact or Romantic Fiction?	114
4.5	Switches: The Positive Feedback Processes	118
4.6	Alternative Stable States	133
4.7	Negative Feedback	138
4.8	Stability	138
4.9	Diversity → Productivity	153
4.10	Conclusions	156
5	Assembly Rules	160
5.1	Introduction	160
5.2	What Rules Should Ecologists Search for, and How?	161
5.3	Zonation	165
5.4	Species Sorting	170
5.5	Richness	174
5.6	Limiting Similarity	176
5.7	Guild Proportionality	185
5.8	Texture Convergence and Trait-Based Analyses	194
5.9	The Fate of Associations through Time	198
5.10	Abundance	200
5.11	Keystone Species	205
5.12	Exotic Species as Community Structure Probes	206
5.13	Case Study: The Otago Botany Lawn	216
5.14	Conclusions	221
6	Theories and Their Predictions	223
6.1	Introduction	223
6.2	The Clements/Gleason Synthesis	227
6.3	Whittaker, Austin and Continuum Theory	234
6.4	Hubbell and Chance	237
6.5	Grime's C-S-R Theory	240
6.6	Tilman's Theories	249
6.7	Where Will Competition Be Strongest?	256
6.8	Where Will Facilitation Be Strongest?	261
6.9	Conclusion	263

7	Synthesis	265
	7.1 Introduction	265
	7.2 The 'Paradox of the Plankton'	265
	7.3 Heterogeneity	266
	7.4 Assembly Rules	270
	7.5 Processes: Reaction and Switches	275
	7.6 Conclusion	277
	 <i>References</i>	281
	<i>Subject Index</i>	348
	<i>Taxonomic Index</i>	351