

Contents

1	Precambrian Terrains and Mountain Building Processes	1
1.1	Introduction	1
1.2	Archaean Terrains	3
1.3	Proterozoic Terrains	7
1.4	Mountain Building Processes	9
1.4.1	Geosynclinal Theory	9
1.4.2	Plate Tectonics Theory	12
1.5	Continental Rifting and Sedimentary Basins	22
1.5.1	Rifting and Triple Junctions	24
1.5.2	Pull-Apart Basin	28
1.5.3	Foreland Basin	30
1.6	Orogeny and Plate Tectonics	30
1.7	The Wilson Cycle	35
1.8	Suspect Terrains	38
	References	39
2	Cratons of the Indian Shield	41
2.1	Introduction	41
2.2	Dharwar Craton	43
2.2.1	Introduction	43
2.2.2	Evolution of Dharwar Schist Belts	50
2.2.3	Geodynamic Models for the Evolution of Dharwar Craton	52
2.3	Bastar Craton	58
2.3.1	Introduction	58
2.4	Singhbhum Craton	65
2.4.1	Geodynamic Evolution	72
2.5	Chhotanagpur Granite-Gneiss Complex	72
2.5.1	Archaean Status of CGGC Questioned	81
2.6	Rajasthan Craton	83
2.6.1	Banded Gneissic Complex and Berach Granite	84
2.6.2	BGC: Antiquity Challenged and Nomenclature Changed	85
2.6.3	Geological Setting	87

2.6.4	Evolution of the Banded Gneissic Complex	92
2.6.5	Bundelkhand Granite Massif (BKC)	94
2.7	Meghalaya Craton	98
	References	102
3	The Young and Old Fold Belts	117
3.1	Introduction	117
3.2	Himalaya as an Example of the Young Fold Belt	118
3.2.1	Geological Setting	118
3.2.2	Evolution of Himalaya	122
3.3	Old Fold Belts	134
3.4	Proterozoic Fold Belts of India	136
3.5	Ensialic Orogenesis Model	136
	References	138
4	Aravalli Mountain Belt	143
4.1	Introduction: Geological Setting	143
4.2	Aravalli Fold Belt	143
4.2.1	Aravalli Stratigraphy: Controversies	146
4.2.2	Geochronology: Time of Aravalli Orogeny	148
4.3	Delhi Fold Belt	149
4.3.1	Delhi Stratigraphy: Controversies	150
4.3.2	Geochronology: Time of Delhi Orogeny	151
4.4	Deformation of the Proterozoic Fold Belts	153
4.5	Geohistory of Granulites	154
4.6	Agreed Observations and Facts	157
4.7	Evolutionary Models and Discussion	159
4.8	Geophysical Database	170
4.9	Conclusions	171
	References	172
5	Central Indian Fold Belts	177
5.1	Introduction	177
5.2	Mahakoshal Fold Belt	179
5.2.1	Introduction: Geological Setting	179
5.2.2	Agreed Observations and Facts	180
5.2.3	Evolution of the Mahakoshal Fold Belt (MFB)	181
5.3	Satpura Fold Belt	182
5.3.1	Introduction: Geological Setting	182
5.4	Agreed Observations and Facts	185
5.4.1	Evolution of the Satpura Fold Belt (SFB)	186
5.5	Geological Significance of the Central Indian Tectonic Zone	189
5.6	Dongargarh Fold Belt	191
5.6.1	Introduction: Geological Setting	191
5.6.2	Agreed Observations and Facts	194
5.6.3	Evolution of the Dongargarh Fold Belt (DFB)	194

5.7	Sakoli Fold Belt	195
5.7.1	Introduction: Geological Setting	195
5.7.2	Agreed Observations and Facts	196
5.7.3	Evolution of the Sakoli Fold Belt (SKFB)	197
5.8	Discussion of Evolutionary Models of the Central Indian Fold Belts	198
	References	204
6	Singhbhum Fold Belt	209
6.1	Introduction: Geological Setting	209
6.2	Deformation	213
6.3	Metamorphism	214
6.4	Geochronolgy	215
6.5	Agreed Observations and Facts	217
6.6	Evolution of the Singhbhum Fold Belt (SMB)	218
6.7	Evolutionary Models and Discussion	220
	References	226
7	Eastern Ghats Mobile Belt	231
7.1	Introduction: Geological Setting	231
7.2	Deformation	234
7.3	Geochronology	235
7.4	Petrological Characteristics	236
7.5	Tectono-Thermal Evolution	236
7.6	Northern Segment	237
7.6.1	Southern Segment	239
7.7	Is Godavari Graben a Major Terrain Boundary?	241
7.8	Agreed Observations and Facts	242
7.9	Evolutionary Models and Discussion	243
7.10	Newer Divisions of the Eastern Ghats Mobile Belt	248
7.10.1	Rengali Province	253
7.10.2	Jeypore Province	253
7.10.3	Krishna Province	253
7.10.4	Eastern Ghats Province	254
	References	257
8	Pandyan Mobile Belt	263
8.1	Introduction: Geological Setting	263
8.2	Geological Attributes of the Granulite Blocks	265
8.3	Pandyan Mobile Belt	272
8.4	Agreed Observations and Facts	276
8.5	Evolutionary Models and Discussion	276
	References	284
	Postscript	291
	Appendix	293

About the Book 295

About the Author 297

Index 299