

Petrology of the Sedimentary Rocks

J. T. Greensmith

University College, University of London

SEVENTH EDITION

London

UNWIN HYMAN

Boston

Sydney

Wellington



Contents

Preface to the seventh edition	page v
1 Introduction	1
2 Soils	2
Soil-forming processes	3
Soil classification	5
Modern and ancient soil types	6
References	12
3 Sedimentary structures	14
Bedding	14
Ripples, dunes and cross-bedding	16
Turbidites; graded beds and sole structures	22
Deformational structures	26
Biogenic structures	31
References	36
4 Rudaceous deposits	39
Classification	39
Composition of pebbles	42
Shape and roundness of pebbles	44
Sedimentary rudaceous deposits	45
Transported rudaceous deposits	46
References	53
5 Arenaceous deposits	54
Classification	56
Varieties of sandstone	58
Diagenesis	69
Accessory minerals	78
References	83

6	Argillaceous deposits	page 85
	Composition	86
	Diagenesis	88
	Clay minerals and environment	92
	Marine deposits	95
	Freshwater and terrestrial deposits	99
	References	101
7	Limestones	103
	Composition	103
	Classification	104
	Allochemical limestones	109
	Orthochemical limestones	129
	Terrestrial deposits	133
	Reef rocks and buildups	133
	Diagenesis	136
	References	138
8	Magnesian limestones and dolomites	141
	Dolomitization	142
	Magnesitic deposits	150
	References	151
9	Siliceous deposits	153
	Forms of silica	154
	Silica deposition	155
	Biogenic siliceous sediments	156
	References	163
10	Ferruginous deposits	165
	Sedimentary iron ore minerals	165
	Transportation and deposition of iron	168
	Ironstones and iron-formations	170
	Non-marine ironstones	179
	References	181

11	Carbonaceous and bituminous deposits	page 182
	Organic constitution of coals	184
	Rank in coals	186
	Humic coals	189
	Sapropelic coals	192
	Oil-shales	193
	References	201
12	Phosphatic deposits	203
	Sedimentary phosphate minerals	203
	Constitution and classification of phosphorites	204
	Controls on marine phosphorite deposition	206
	Bedded marine phosphorites	208
	Phosphatic nodules	211
	Terrestrial phosphates	212
	References	215
13	Evaporites	217
	Controls on evaporite precipitation	217
	Classification	220
	Terrestrial salt deposits	221
	Marine salt deposits	228
	Ancient evaporites	230
	References	238
14	Volcaniclastic deposits	240
	Classification and constitution	240
	Pyroclastic deposits	246
	Hydroclastic (hyaloclastic) deposits	249
	Associated sediments	249
	Diagenetic derivatives	251
	References	254
	Index	256