Geographies for advanced study

## Geomorphology

SECOND EDITION



B.W.Sparks

## Contents

and the first adition	xix
Preface to the first edition	xxi
Preface to the second edition	1
1 The aims and position of geomorphology Relations with other subjects	4
2 The Davisian geographical cycle  The geographical cycle or the cycle of erosion  The ideal geographical cycle	<b>7</b> 8 8
Interruptions of the cycle  The use of the cycle	17 18
3 Weathering The agents of weathering Physical weathering Chemical weathering Biological weathering	22 22 22 30 32
Factors affecting weathering The effect of mineral composition on weathering The effect of texture on weathering The effect of minor structures on weathering The effect of climate on weathering The effect of time on weathering	32 35 36 39 41 44
The weathering of sedimentary rocks	45
The weathering of metamorphic rocks	47
4 The development of slopes  Mass movement on slopes	49
Classification of mass movements Mass movements involving slow flow Mass movements involving rapid flow Mass movements involving sliding The significance of mass movements on slopes in Great Britain Mechanisms of slope movements	50 50 51 53 54 55
Erosion of slopes by moving waste	6

## Contents

The development of slope profiles Geometric studies of slopes Inductive studies of slopes Statistical studies of slopes	
The question of parallel retreat	<sup>9</sup>
Conclusion	); 84 82
5 The nature of a river valley	8ģ. 92
The initiation of streams	
Features of the long-profile of a river Transport, erosion and deposition Grade, equilibrium or the steady state	<b>94</b>
Features of the cross-profile of a river Lateral erosion	96 97 107
The meandering habit of streams	116
Conclusion	119
6 Th. 1	126
6 The development of drainage systems	
Drainage systems in relation to geology	127
Genetic stream terminology  Descriptive stream terminology	127
	127 131
The adaptation of streams to structures  The development of subsequent streams	
Drainage patterns	131 134
Drainage patterns discordant to structure	143
Drainage systems in relation to geometry	144
so systems in relation to geometry	157
7 The effects of rocks on relief	07
The effects of structure	165
The effects of lithology	165
Factors governing resistance to erosing	168
The effects of resistance on the relief	168
Practical considerations The significance of facies	171 174
The importance of detailed lithological studies	179
Igneous relief	182
Limestone relief	183
Landforms on massive line	190
at Hillesione problem	190
Chalk relief	199
8 Coastal features	204
Factors affecting	215
The effect of waves	215
1 IUCS Curron	216
The effect of the nature of the coast on erosion The nature of the wavecut beach	222
vi wavecut beach	224 232

	Contents	
The constructive action of the sea	240	
Longshore drift	240 243	
Minor constructional features Major constructional features	245	
Coral Coasts	266	
Deltas	275	
Classification of coasts and shorelines	279	
	202	
9 Movements of base level	<b>282</b> 283	
Positive movements of base level	289	
Negative movements of base level  Methods of investigating features of rejuvenation	303 308	
Field methods	200000000000000000000000000000000000000	
10 The importance of changes of climate	312	
11 Landforms in arid and semi-arid climates	318	
11 Landforms in arid and semi-arid climates  Weathering under arid conditions	319	
The effects of wind	320	
The effects of water	330	
Pediments, pediplains and inselbergs	334	
12 Landforms in the humid tropics	342	
General weathering processes	342	
Silica weathering	345	
The etchplain or weathering front	346	
Surface crusts or duricrusts	347	
Slope development	349	
Stream activity	351	
Lithological effects	35 <sup>2</sup>	
Savanna plains and inselbergs	353	
13 Landforms in glaciated highlands	358	
Introduction	358	
Isostatic movements in glaciated areas	361	
Corries and arêtes	370	
Glaciated valleys and associated features	378	
Fjords and allied features	391	
	396	
Glacial breaching of watersheds	V 399	

14 Landforms in glaciated lowlands	401
Glacially eroded lowlands  Depositional landforms in lowlands  Forms composed of unstratified drift  Forms composed of stratified drift	40 <sub>1</sub> 40 <sub>4</sub> 40 <sub>6</sub> 41 <sub>3</sub>
Glacial diversions of drainage	419
15 Periglacial landforms Periglacial deposits	<b>436</b>
Periglacial structures Thermokarst Ice mounds Ice wedges Polygonal patterns Involutions	443 443 444 448 451 455
Landform modification in periglacial climates	456
16 Erosion surfaces and their interpretation Characteristics of various types of erosion surface Peneplains Panplains Plains of marine denudation Pediplains Glacial and periglacial erosion surfaces Exhumed surfaces The Central Plateau of France	459 460 460 464 465 467 467 468
Southeastern England	471
Southern Africa	475
The Cambridge area	479
References	482
	488
Abbreviations used in the references	508
Index	300
	511