

A climate of arctic severity prevailed in Britain throughout much of the last two million years, resulting in the widespread formation of a great range of periglacial landforms and deposits. Many of these features provide key evidence for understanding the evolution of the present landscape and reconstructing former climate. Appreciation of the significance of periglacial deposits and structures is also important in many engineering operations and in understanding the development of present-day soils.

This book provides a synthesis of current theory in periglacial geomorphology and applies this to the study of periglacial phenomena in Great Britain. The first part of the book introduces the chronological and environmental background to periglaciation in Britain. The second and third parts deal respectively with the periglaciation of lowland Britain and upland Britain. The book concludes by considering the implications of periglacial phenomena for environmental reconstruction.

The Periglaciation of Great Britain can be used as a text for geography and geology undergraduates studying cold-climate geomorphology, and is also an important and unique reference for all whose teaching or research encompasses a knowledge of periglacial phenomena, including geomorphologists, geologists, Quaternary scientists, civil engineers and pedologists.

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The Periglaciation of Great Britain

COLIN K. BALLANTYNE
Senior Lecturer in Geography and Geology, University of St Andrews

CHARLES HARRIS
Senior Lecturer in Geology, University of Wales, Cardiff



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Contents

<i>Preface</i>	ix	related ground-ice features	70
PART 1: Introduction and context	1	Thermokarst depressions	71
1 Introduction	3	Morphological evidence of Pleistocene pingos and related cryogenic mounds	73
The development of periglacial research in Great Britain	4	Evidence for Pleistocene pingos and related cryogenic mounds in Britain	74
Approaches to synthesis: the organisation of this book	7	Large thermokarst depressions	80
2 Quaternary environmental change in Great Britain	11	The significance of ground-ice phenomena in Britain: an evaluation	82
The Anglian glacial stage	11	6 Active layer processes: cryoturbation and patterned ground	85
Glaciation between the Hoxnian and Ipswichian Interglacials ('Wolstonian')	14	Active layer processes	85
The Early and Middle Devensian	14	Patterned ground	89
The Late Devensian 1: The Dimlington Stadial	15	Cryoturbation	94
The Late Devensian 2: The Windermere Interstadial	17	Quaternary patterned ground in lowland Britain	96
The Late Devensian 3: The Loch Lomond Stadial	18	Cryoturbation structures in lowland Britain	99
The Flandrian Interglacial	21	Pedological evidence for soil freezing and permafrost	109
Present-day environmental conditions on British mountains	22	Summary	112
Periglacial environments in space and time	24	7 Periglacial mass wasting and slope evolution in lowland Britain	113
3 Periglacial environments	27	The nature of thawing soils	113
Periglacial climates	27	Processes of periglacial mass wasting	114
Vegetation	28	Slow periglacial mass movements	114
Soils	29	Rapid mass movements	118
Fauna	30	Ground-ice slumps	118
Permafrost	31	Permafrost creep	119
PART 2: The periglaciation of lowland Britain	37	Slopewash	120
4 Ice-wedge casts and relict tundra polygons	39	Periglacial slope evolution in lowland Britain	120
Ice-wedges, sand wedges and tundra polygons	39	Periglacial slope deposits	121
Mechanism of wedge casting and characteristics of casts	44	Granular head deposits derived from nonargillaceous rocks	122
Recognition of permafrost wedge casts	46	Clay-rich head deposits	130
Permafrost wedge casts and tundra polygons in Great Britain	47	Granulometry and geotechnical properties of head deposits	134
The stratigraphy of wedge casts and relict tundra polygons	53	Thaw-induced periglacial landslides in bedrock	135
The significance of wedge casts and polygonal crop marks	62	Relict ground-ice slumps	136
5 Pingos and related ground-ice phenomena	65	Slope evolution	136
Characteristics of active pingos	65	Cambering and valley bulging	137
Other ice-cored mounds	68	Periglacial slope processes and landscape evolution: concluding comments	140
The climatic significance of pingos and		8 Lowland landscape modification by fluvial and aeolian processes	141
		Periglacial rivers and river valleys	141
		Pleistocene fluvial landforms and deposits	147

Wind action	155	12 Talus slopes and related landforms	219
The significance of periglacial fluvial and aeolian activity	160	Rockfall talus slopes	219
PART 3: The periglaciation of upland Britain	161	Avalanche-modified talus	226
9 Frost weathering and mountain-top detritus	163	Debris flow activity	227
Periglacial weathering	163	Protalus ramparts	236
Periglacial weathering in upland Britain	166	Protalus rock glaciers	240
Mountain-top detritus	173	Talus and related landforms: summary	244
Upland tors	178	13 Nival, fluvial, aeolian and coastal features	245
Periglacial trimlines	182	Nivation and cryoplanation	245
Mountain-top detritus and the distribution of periglacial landforms	187	The geomorphic role of running water	250
The significance of mountain-top detritus on British mountains	190	The action of wind	255
10 Patterned ground on British mountains	193	Shoreline erosion under periglacial conditions	267
Sorted patterned ground on British uplands	193	PART 4: Periglacial environments	273
Nonsorted patterned ground in upland Britain	199	14 Past and present periglacial environments	275
Summary	203	Periglacial environments during the Dimlington Stadial	278
11 Solifluction landforms in upland Britain	205	The periglacial environment of the Loch Lomond Stadial	286
Valley-floor solifluction terraces	205	The present-day periglacial environment of upland Britain	292
Relict solifluction phenomena on the upper slopes of British mountains	208	Themes and prospects	297
Active solifluction phenomena	214	<i>References</i>	299
Solifluction landforms in upland Britain: problems and potential	218	<i>Index</i>	325

Preface

One of the most interesting paradoxes of geomorphology is that few of the earth's landscapes can be explained in terms of the processes currently operating on them. The explanation for this paradox lies in the dramatic changes that have affected global climate over the last two million years or so. During much of this time, Great Britain experienced conditions significantly colder than those of the present, and such cooling introduced a wide range of geomorphic effects that are now confined to arctic, subarctic and cold montane environments. The most dramatic of these was the formation of glaciers, which carved out distinctive erosional forms in upland areas and deposited a mantle of drift over much low ground. More subtle, but more widespread, was the influence of periglaciation, the modification of landscape under nonglacial cold-climate conditions. Periglacial processes have dominated the recent evolution of those parts of the British landscape that lay beyond the reach of the ice sheets, and have modified – in some areas extensively – those areas that formerly lay under glacier ice. Even when (as at present) warmer interglacial conditions interrupted the prevailing cold, the zone of periglacial activity merely retreated to the highest parts of British mountains, awaiting a climatic summons to return to low ground.

This book synthesises current knowledge concerning the effects of periglaciation on the British landscape. It is set out in four parts. The first provides an introduction to the concept of periglaciation, and establishes the chronological and environmental context necessary for the understanding of later material. Part 2 is devoted to the periglaciation of lowland Britain, which comprises those areas that lie below about 400 m in altitude, are underlain mainly by sedimentary rocks and are extensively mantled by drift deposits. The third part describes the periglaciation of upland Britain, an area of generally more resistant rocks that have been subject to repeated episodes of glacial erosion, and which is consequently characterised by steep slopes with only a thin, discontinuous drift cover. This upland/lowland distinction reflects not only the rather different assemblages of periglacial phenomena encountered in these two zones, but also the fact that parts of upland Britain continue to experience periglacial activity at present, whereas the periglacial landscapes of lowland Britain are entirely relict. The final part of the book brings together many of the phenomena previously considered individually by outlining the characteristics of three contrasting periglacial environments: that of the Dimlington Stadial of c. 26 000–13 000 years BP (before present), when glacier ice advanced to cover two-thirds of the present land surface; that of the Loch Lomond Stadial of c. 11 000–10 000 years BP, when glacier ice remained confined to upland areas; and that of the present, when glacier ice is absent and periglacial activity is restricted to high ground.

The aim of this book, however, is not merely to summarise current knowledge concerning periglacial features in Great Britain, but also to demonstrate how such features illustrate the wider corpus of knowledge that constitutes periglacial geomorphology. With this end in view, the chapters that constitute the core of the book (Chapters 4–13) are prefaced by general introductions that summarise current understanding of the formation and environmental significance of particular periglacial phenomena. Each of these introductions draws widely from a range of theoretical, laboratory and field research, and incorporates findings from a wide range of present periglacial environments, such as the arctic wastes of Canada, Alaska and Siberia, or the mountains of the Alps, the North American Cordillera and Scandinavia. In this way the volume attempts to demonstrate how current theory in periglacial research can be applied to enhance understanding of the periglacial geomorphology of Great Britain, and equally how periglacial phenomena may be interpreted to help reconstruct past episodes in the overall evolution of the British landscape. The book thus represents a case study in the interpretation of periglacial phenomena in a landscape of varying terrain and complex climatic history. It is designed to be of relevance to all earth scientists whose research interests include cold-climate geomorphology and the reconstruction of Quaternary palaeoenvironments.

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