

# Contents

<i>Frontispiece</i>	page	iv
<i>Foreword</i>		vii
<i>Editors' preface</i>		ix
<i>Wastwater, May 1967</i>		xi
MICHAEL J. TOOLEY		
<i>Acknowledgements</i>		xiii
<i>List of tables</i>		xix
<i>List of contributors</i>		xxi
<b>1</b> <i>The life and work of Gordon Manley</i>		1
MICHAEL J. TOOLEY and GILLIAN M. SHEAIL		
1.1 Introduction		1
1.2 Early life and work, 1902–47		2
1.3 Later life and work, 1948–80		5
1.4 The weather in Britain by Gordon Manley		8
1.5 <i>Collectanea meteorologica Britannica</i>		13
1.6 Conclusion		14
Acknowledgements		15
References		15
<b>2</b> <i>The Durham University Observatory record and Gordon Manley's work on a longer temperature series for north-east England</i>		17
JOAN M. KENWORTHY		
2.1 Introduction		17
2.2 The founding of the observatory at Durham		18
2.3 The beginning of meteorological observations at Durham		20
2.4 The Durham temperature record, 1847–1979		22
2.5 The Durham temperature record, 1842–7		23
2.6 A temperature series for north-east England		27
2.7 The Losh record, 1802–33		29
2.8 Bridging the gap: the period 1833–47		32
2.9 A tentative series of mean monthly temperatures for north-east England from 1801		33
2.10 Conclusions		35
Acknowledgements		36
References		36

3	<i>Variations in the Durham rainfall and temperature record, 1847–1981</i>	39
	RAY HARRIS	
3.1	Introduction	39
3.2	Precipitation 1886–1981	40
3.3	Temperature 1900–81	45
3.4	Mean temperature 1847–1981	54
3.5	Discussion and conclusion	57
	References	59
4	<i>Some aspects of rainfall records with selected computational examples from northern England</i>	60
	ELIZABETH M. SHAW	
4.1	Introduction	60
4.2	Precipitation measurement	62
4.3	Compilation of long records	64
4.4	Analysis of long records	67
4.5	Two northern England rainfall records	74
4.6	Further considerations	90
	Acknowledgements	90
	References	90
5	<i>A critical assessment of proxy data for climatic reconstruction</i>	93
	HERMANN FLOHN	
5.1	Introduction	93
5.2	Sources	94
5.3	On the representativity of proxy data	95
5.4	Calibration experiments with proxy series	98
5.5	Conclusion	99
	Appendix A. Proxy data used to check the homogeneity of temperature records	100
	Appendix B. Two oak tree-ring series from western Germany	101
	Acknowledgements	102
	References	102
6	<i>The Little Ice Age period and the great storms within it</i>	104
	HUBERT H. LAMB	
6.1	Introduction: air temperatures	104
6.2	Ocean surface temperatures and their effects on the air temperature pattern	107
6.3	Atmospheric pressures and the general wind circulation pattern	110
6.4	Studies of great storms in the Little Ice Age period	116
	Acknowledgements	129
	References	130

7	<i>The timing of the Little Ice Age in Scandinavia</i>	132
	JEAN M. GROVE	
7.1	Introduction	132
7.2	Southern Norway	134
7.3	Northern Scandinavia	144
7.4	Conclusions	148
	Acknowledgements	150
	Manuscript references	150
	References	150
8	<i>Snow cover, snow-lines and glaciers in Central Europe since the 16th century</i>	154
	CHRISTIAN PFISTER	
8.1	Introduction	154
8.2	Dates of snow cover	155
8.3	Formation and melting of snow cover as a result of accumulation and ablation	157
8.4	The duration of snow cover in the lowlands since the 16th century	159
8.5	Changes in the seasonality of snowlines	161
8.6	Patterns in plant development and dynamics of the temporary snowline	167
8.7	Fluctuations of snowlines and glacier variations	172
	Acknowledgements	172
	References	173
9	<i>Peat stratigraphy and climatic change: some speculations</i>	175
	KEITH E. BARBER	
9.1	Introduction	175
9.2	Temporal questions	176
9.3	Behavioural questions	180
	Acknowledgement	183
	References	184
10	<i>Geomagnetism and palaeoclimate</i>	186
	FRANK OLDFIELD and SIMON G. ROBINSON	
10.1	Introduction	186
10.2	Some critical distinctions	187
10.3	Mineral magnetism and palaeoclimate in lake sediments	190
10.4	Mineral magnetic measurements and palaeoclimatic indices in deep-sea sediments	194
10.5	The origin of magnetic minerals in deep-sea sediments	199
	Acknowledgements	203
	References	203

11	<i>Climate, sea-level and coastal changes</i>	206
	MICHAEL J. TOOLEY	
11.1	Introduction	206
11.2	Processes affecting sea-level and coastal changes	207
11.3	Coastal sedimentation during the Flandrian Age	209
11.4	Coastal sedimentation in south-west Lancashire (UK)	211
11.5	Sea floods and blowing sand on the Lancashire coast	223
11.6	The stratigraphic record of storms	226
11.7	Correlation of low-altitude coastal sediments	228
11.8	Conclusions	229
	Acknowledgements	230
	References	230
12	<i>The effect of climate on plant distributions</i>	235
	RICHARD N. CARTER and STEPHEN D. PRINCE	
12.1	Introduction	235
12.2	Strategies used in explaining distribution limits	238
12.3	Some physiological effects of the climate	242
12.4	Other effects of climate	245
12.5	Discussion	246
	References	251
13	<i>Climate and the diseases and pests of agriculture</i>	255
	AUSTIN BOURKE	
13.1	Introduction	255
13.2	Climate and the spread of parasites to new areas	256
13.3	The bioclimatic approach to pathogens and pests, and some of its limitations	259
13.4	Climate and the diseases of agricultural plants: in particular, potato blight	263
13.5	Climate and the diseases of livestock: in particular, liver fluke	268
13.6	Towards a climatology of disease potential	269
13.7	Meteorology and the transport of inoculum	270
13.8	Climatic change and the impact of disease	273
13.9	The future	275
	References	276
	<i>Bibliography of papers by Professor Gordon Manley</i>	279
	GILLIAN M. SHEAIL, JOAN M. KENWORTHY and MICHAEL J. TOOLEY	
	<i>List of articles by Gordon Manley in The Manchester Guardian</i>	286
	PETER McNIVEN and MICHAEL J. TOOLEY	
	<i>Author index</i>	289
	<i>Subject and place index</i>	295