CONTENTS

	List of plates	х
	List of figures	xi
	List of tables	xv
	Preface	xvii
	Acknowledgements	xix
1	INTRODUCTION	1
	Introduction	1
	Timescales and terminology	3
	Notes	4
2	OCEAN SEDIMENTS AND ICE CORES	6
	Oxygen isotope variations in ocean sediments	6
	Oxygen isotope analysis of ice cores	16
	Inferred patterns of global environmental change	22
3	ICE AGE PALAEOCLIMATES AND COMPUTER	
	SIMULATIONS	24
	Introduction	24
	Ice age general circulation models (GCMs)	24
	Ice age palaeoclimates in the northern hemisphere	31
	Ice age palaeoclimates in the southern hemisphere	38
	Summary	40
4	GLACIATION HISTORY FROM THE LAST	
	INTERGLACIAL TO THE LAST GLACIAL	
	MAXIMUM	42
	Introduction	42
	Extent of ice cover in Eurasia and the Arctic	44
	Glaciation history of Scandinavia and northern Europe	49
	Late Quaternary ice sheets in North America	55
	Rest of the world	63
	Models of Late Quaternary ice sheet evolution	70
	Summary	71

CONTENTS

5	THE MELTING OF THE LAST GREAT ICE	
	SHEETS	73
	Introduction	73
	Deglaciation of the Eurasian ice sheet	74
	Deglaciation of the Laurentide and Cordilleran ice sheets	84
	The Antarctic and Greenland ice sheets during global deglaciation	103
	The enigma of Younger Dryas cooling	104
	Summary	106
	Notes	108
6	ICE AGE PERIGLACIAL ENVIRONMENTS	109
	Introduction	109
	Problems in permafrost reconstruction	109
	Permafrost evolution	112
	Late Quaternary permafrost in the USSR	114
	Late Quaternary permafrost in North America	119
	Late Quaternary periglacial environments in Europe	122
	Palaeoclimatic inferences	123
	Summary	124
7	LAKES, BOGS AND MIRES	126
	Introduction	126
	The long-term evolution of lakes, bogs and mires	127
	Long sediment sequences obtained from lakes, bogs and mires	129
	The so-called 'pluvial' lakes	131
	Ice-dammed lakes	139
	Summary	140
8	RIVERS	143
	Introduction	143
	Factors that affect hydrological response	146
	Palaeohydrological changes in low latitudes	147
	Superflood 'events' and ice-dammed lakes	151
	Summary	159
9	ICE AGE AEOLIAN ACTIVITY	162
	Introduction	162
	Loess	163
	Late Quaternary loess stratigraphy	168
	Dunes	172
	Evidence from ocean and ice cores	17 <i>6</i>
	Summary	178
10		180
	Introduction	180
	Summary LATE QUATERNARY VOLCANIC ACTIVITY	101

CONTENTS

Major volcanic eruptions and Late Quaternary climate	18.
Influence of climate change on volcanic activity	196
Summary	196
CRUSTAL AND SUBCRUSTAL EFFECTS	199
Introduction	199
Mantle viscosity and crustal deformation	199
Crustal deformation caused by ice sheets	201
Crustal disturbance along active plate margins	21
Summary	213
Notes	214
LATE QUATERNARY SEA LEVEL CHANGES	215
Introduction	215
Factors affecting long-term sea level changes	217
	223
Sea level changes during the last 18,000 years	227
Summary	232
Notes	234
MILANKOVITCH CYCLES AND LATE	
QUATERNARY CLIMATE CHANGE	235
Milankovitch cycles	235
Patterns of Late Quaternary climate change based on geological and	
Milankovitch criteria	243
Discussion	253
References	257
Index	280
	Influence of climate change on volcanic activity Summary CRUSTAL AND SUBCRUSTAL EFFECTS Introduction Mantle viscosity and crustal deformation Crustal deformation caused by ice sheets Crustal disturbance along active plate margins Summary Notes LATE QUATERNARY SEA LEVEL CHANGES Introduction Factors affecting long-term sea level changes Late Quaternary relative sea level fluctuations Sea level changes during the last 18,000 years Summary Notes MILANKOVITCH CYCLES AND LATE QUATERNARY CLIMATE CHANGE Milankovitch cycles Patterns of Late Quaternary climate change based on geological and Milankovitch criteria Discussion References