

Contents

Introduction 8

THE CHANGING GLOBE

THE CHANGING FACE OF THE EARTH 12

VENDIAN TIMES 14

EARLY CAMBRIAN TIMES 16

LATE CAMBRIAN TIMES 18

ORDOVICIAN TIMES 20

SILURIAN TIMES 22

DEVONIAN TIMES 24

CARBONIFEROUS TIMES 26

PERMIAN TIMES 28

TRIASSIC TIMES 30

JURASSIC TIMES 32

Early Cretaceous Times 34

LATER CRETACEOUS TIMES 36

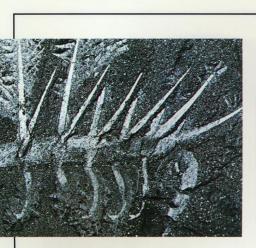
K-T TIMES 38

EARLY TERTIARY TIMES 40

MID-TERTIARY TIMES 42

LATE TERTIARY TIMES 44

QUATERNARY TIMES 46







ANCIENT WORLDS

THE ORIGIN OF LIFE 50 AQUATIC MICROBES: LIFE BEGINS 52 THE VENDIAN PERIOD 54 COMPLEX ORGANISMS EMERGE 56 CAMBRIAN EXPLOSION 58 EARLY CAMBRIAN MARINE LIFE 60 LATE CAMBRIAN PERIOD 62 THE BURGESS SEAWORLD 64 PIKAIA—OUR ANCESTOR? 66 THE ORDOVICIAN PERIOD 68 LIFE IN THE ORDOVICIAN SEAS 70 THE SILURIAN PERIOD 72 Life on Land and in the Sea 74 THE DEVONIAN PERIOD 76 Equipping Life for Land 78 CARBONIFEROUS AGE 80 THE FIRST TETRAPODS 82 COAL AND REPTILES 84 THE PERMIAN AGE 86 ANCIENT MAMMAL RELATIVES 88 Mass Extinctions 90 THE TRIASSIC PERIOD 92 DAWN OF THE DINOSAURS 94 REPTILIAN DOMINATION 96 THE JURASSIC PERIOD 98 REPTILES OF THE JURASSIC SEAS 100 DISCOVERING EXTINCTION AND DEEP TIME 102 LIFE TAKES TO THE AIR 104

EARLY MAMMALS 106

EARLY CRETACEOUS PERIOD 108 THE WORLD OF THE IGUANODON DINOSAUR 110 INVENTING AND PICTURING THE DINOSAURS 112 LATER CRETACEOUS PERIOD 114 THE MAMMALS AND DINOSAURS OF MONGOLIA 116 HADROSAURS AND CARNOSAURS 118 THE BEAST OF MAASTRICHT 120 THE K-T BOUNDARY 122 THE LAST OF THE DINOSAURS 124 IMPACT FROM OUTER SPACE 126 VICTIMS AND SURVIVORS 128 EARLY TERTIARY AGE 130 PLANTS AND ANIMALS OF MESSEL 132 OPENING THE NORTH ATLANTIC 134 THE EVOLUTION OF PLANTS AND FLOWERS 136 MID-TERTIARY PERIOD 138 RIVERSLEIGH MARSUPIALS 140 THE HIMALAYAS AND THE TIBETAN PLATEAU 142 LATE TERTIARY PERIOD 144 HOMINIDS AND OTHER MAMMALS 146 Mammals of the Americas 148 DIVERGENCE OF APES AND HOMINIDS 150 THE QUATERNARY AGE 152 THE RUSSIAN MAMMOTH STEPPE 154 THE HUMAN JOURNEY 156 BEYOND THE ICE AGE 158



EARTH FACT FILE

EARTH HISTORY 162

The Geological Timescale 164
Methods of Dating: Innovations and Discoveries 166
Geological Controversies 168

Rock 170

METAMORPHIC AND SEDIMENTARY ROCK 172

Earth Processes: Plate Tectonics 174

Earthquakes and Tsunamis 176

Volcanoes 178

SEDIMENTATION 180

The Present as a Key to the Past 182

WHAT NEXT? 184

Fossils: Classification 186

Fossil Formation 188

Fossil Discoveries: Reconstructing the Past 190 Evolution and the Fossil Record 192 Living Fossils and the Molecular Clock 194

"Progress" and Catastrophe 196

BIOGRAPHIES 198
PLACES AND WEBSITES TO VISIT 202
GLOSSARY 204
FURTHER READING AND BIBLIOGRAPHY 216
INDEX 218
ACKNOWLEDGMENTS 224