

Index

Note: **bold** type numbers denote illustrations and tables

- Acerno Basin, S Italy *see* pollen analysis, Acerno
Acmaea testudinalis 115
Albian
 latest
 distribution of planktonic Foraminiferida 36–8
 paleogeography map **37**
 planktonic morphotypes **34**
angiosperms, Maastrichtian 46
Archaeon, temperature history 2
Arctica islandica, Boreal Guest, Mediterranean region 113–17
Arvicola, Uzzo cave, Sicily 180
Atlantic affinity (Aa) species 114
Austria, SE, Late Quaternary vertebrate cave deposits, taphocoenoses 199–211
 geological and morphological setting 199–200
 karst rocks
 chronology **205**
 location map **200**
 palaeoclimatic significance 204–10
 biological and archaeological biases 204
 contextual malacology 208
 glaciology and palaeoenvironments 209
 human evidence 209–10
 intra-site changes and diversity and regional heterogeneity 206–8
 molluscs 208
 palaeoecological implications 204–6
 palaeovegetation 208–9
 present climatic setting 200–4
 taxa, list **202–3**
Autunian, climatic models, relationship to palaeoclimate in Carboniferous–Permian transition 12–13

Badenian stage, Transylvania, Miocene 58
Balaton, Lake, and Great Hungarian Plain, Late Glacial and Post-Glacial pollen records 121–32
Betic Strait, Lorca Basin (SE Spain) 65, 66
Bilina, North Bohemian Basin, Early Miocene 89–93
 riparian forest **91**
 swamp forest **90**
 upland–shore forest **91**
Bodensee 6
Bohemian Basin, Bilina, Miocene, Early 89–93
Boreal Guests (BGs)
 Mediterranean 113–17
 Residual Boreal Guests (RBGs) 114

calcareous nannofossils, Pleistocene–Holocene changes (Gaeta Bay, Tyrrhenian Sea) 96–100, **97–9**
Cambrian, temperature history 2
Campania, Italy, climate and vegetation, present-day 152–5

Camptonectes tigerinus 115
Carboniferous–Permian transition, lake sediments, lamination and primary production 5–14
Cenomanian time
 bauxites, coals and evaporites **20**
 general circulation model (GCM) palaeoclimate simulations 18–24
 mean temperature **19**
 NPP and LAI, SDGVM solutions **22**
Cenomanian–Turanian planktonic faunas 34
Cenozoic, temperature history 2
chromosomal data
 hominid evolution and climate 189–93
 dichotomic chromosomal model 192
 trichotomic chromosomal model 189–92
climate leaf analysis multivariate program (CLAMP)
 44
 analysis, results 46–8
climatic modelling, Cretaceous, distribution of planktonic Foraminiferida 33–40
 distribution of modern fauna 35–6
 Globotruncana/Rotalipora lines 33–5
 Late Santonian 38–40
 latest Albian 36–8
climatic oscillations vs environmental changes
 Tertiary plant assemblages 89–93
 climatic change within Late Oligocene time in Central Europe 92–3
 environmental bias in palaeoclimatic interpretation of Early Miocene flora of Bilina 90–2
Coldwater (Cw) species, Recent records 115, 118
Constance, Lake, phytoplankton succession 7
Contrada Pianetti–Castello faunal complex, Sicily 175, 179
¹³CO₂, discrimination values **27, 28**
CO₂, high, effects on global terrestrial productivity, Mesozoic era 25–8
Craigia (Tertiary flora) 90
Cretaceous
 Late. *see also* Maastrichtian
 planktonic Foraminiferida, five latitudinal zones 33–40
cycadophytes, Maastrichtian 46

diatoms
 abundances, Equatorial and Antarctic Pacific **71**
 Lorca Basin (SE Spain) 65–76
 see also Miocene, Late, pre-evaporitic diatoms
 Dice coefficient 208
Dryas, Older and Younger Dryas Events, Italy 107
Dryas I–III, Lake Balaton and Great Hungarian Plain 123–6

Egerian stage, Transylvania, Miocene 55

- Eggenburgian stage, Transylvania, Miocene 56
Elephas falconeri faunal complex, Sicily 173–5, 176–7
Elephas mnaidriensis faunal complex, Sicily 174, 175–9
 Enspel, Oligocene lake, sediments 7–8, 11
 environmental changes, vs climatic oscillations, Tertiary plant assemblages 89–93
Equus–elephant event, Early Villafranchian time 168
 European Palaeontological Congress (2nd) 1–2
- Foraminifera, Pleistocene–Holocene changes (Gaeta Bay, Tyrrhenian Sea) 97–9, 100–1
 Foraminiferida, distribution, Cretaceous 33–40
 fossil lakes *see* lake sediments, lamination and primary production
- Gaeta Bay, Tyrrhenian Sea, Pleistocene–Holocene changes 95–107
 Galerian mammal turnover pulse, arrival of *Homo* spp 161, 168
 general circulation model (GCM) palaeoclimate simulations, Mesozoic era 18–24
 coupling with vegetation model 26
 Germany, lake sediments, lamination and primary production 5–14
 Glacial *see* Late Glacial; Post-Glacial
 Global Atmospheric Modelling Program (UGAMP) 18
 global climate change, rate 1
 global terrestrial productivity, Mesozoic era 17–30
 CO₂ effects
 implications for feedback between vegetation and climate 28–9
 quantifying 25–8
 general circulation model (GCM) palaeoclimate simulations for Mesozoic era 18–24
 modelling productivity of terrestrial vegetation 24–5
 SDGVM 25
 validating global predictions of vegetation function 29–30
- Globotruncana/Rotalipora* lines, Foraminiferida 33–5
Glyptostrobus (Tertiary flora) 89–90
 Grazer Bergland *see* Austria, SE
 gymnosperms, Maastrichtian 46
- Holocene *see* Pleistocene–Holocene
 Holzmaar, Lake, sediments 8
 hominid evolution and climate 185–96
 Austrian cave deposits 209–10
 chromosomal data 189–93
 dichotomic chromosomal model 192
 trichotomic chromosomal model 189–92
 climatic patterns through time 187–9
 externalistic approach 186
 Homo, arrival, Galerian mammal turnover pulse 161, 168
 internalistic approach 193–5
 australopithecines, gorillas and chimpanzees 193, 194
 common ancestor 191, 193
 ontogenetic mechanism 186–7
 present gorillas and chimpanzees 194, 195
 primitive and modern *Homo* 195
 polytypic phase, distributios 192
- Hungary
 climatic cycles *see* Miocene, Late, sedimentation (West Hungary)
 Late Glacial and Post-Glacial pollen records, Lake Balaton and Great Hungarian Plain 121–32
 vegetation types 123
- Italy, Quaternary stratigraphy 151
- Kimmeridgian time
 bauxites, coals and evaporites 20
 general circulation model (GCM) palaeoclimate simulations 18–24
 mean temperature 19
 NPP and LAI, SDGVM solutions 22
- lake sediments, lamination and primary production
 modern lake sediments 6–7
 relationship to palaeoclimate in Carboniferous–Permian transition 5–14
 climatic models for Autunian age 12–13
 Lower Permian (Autunian) lakes 8–12
 Paleogene lake strata 7–8
- Late Glacial
 SE Austria 209
 Sicily 180–1
 see also Pleistocene
 Late Glacial and Post-Glacial pollen records, Lake Balaton and Great Hungarian Plain 121–32
 Late Glacial data reconstruction (15–10 ka BP) 123–6
 Allerod (II) 124–6
 Bölling + Dryas II (Ib, Ic) 123
 Dryas I (Ia) 123
 Dryas II (Ic) 123–4
 Dryas (III) 126
- palynological data for reconstruction of Holocene palaeoclimate 126–31
 Atlantic (VI–VII) 128–9
 Boreal (V) 128
 Preboreal (IV) 126–8
 Subatlantic (IX–X) 129–31
 Subboreal (VIII) 129
- latitudinal zones, five, Cretaceous planktonic Foraminiferida 33–40
- leaf area index (LAI)
 CO₂ influence on predictions 23
 SDGVM solutions 22, 25–30
- Lithothamnion bornettii* 118
 Lorca Basin (SE Spain)
 diatoms 65–76, 67
 abundance changes 71, 72
 environmental changes 72–3
 geological setting 66–7
- maar lakes 6
 Maastrichtian (Late Cretaceous) climate, Northern Hemisphere 43–52

- climate leaf analysis multivariate program (CLAMP) paleoclimatic inferences 46–8
- floral assemblages **45**, 46
- floral and dinosaur remains **44**
- latitudinal temperature gradient 51–2
- precipitation 50–1
- temperature 48–50
- Macoma obliqua* 115
- mammalian diversity and turnover patterns, standing richness 166
- mammals, large mammal turnover pulses, Mediterranean region 161–8
- Mediterranean region
- Boreal Guests (BGs) 113–17
- large mammal turnover pulses 161–8
- climate–faunal change correlation 167
- Equus*–elephant event, Early Villafranchian time 168
- Galerian pulse, arrival of *Homo* spp 161, 168
- mammalian diversity and turnover patterns 166–7
- Messinian Salinity Crisis 65–6, 161, 167, 168
- methodological approaches 162–6
- equal time intervals (ETI) 166
- unequal time intervals (UTI) 162–6
- Mediterranean Sea
- isotopic records, locations **142**
- Miocene depots, biostratigraphy 65
- present-day 135–7
- general circulation model (GCM) **139**, 142–3
- Mediterranean Intermediate Water **136**
- Western Mediterranean Deep Water 137
- Mediterranean Sea, sapropel formation 135–49
- environment during sapropel deposition 137–40
- general circulation model (GCM)
- circulation reversal hypothesis 139–40
- comparison with proxy data-based conceptual models 144–5
- Early Holocene experiments, model results 144
- surface fields defined 140–2
- sea surface salinity 141–2
- sea surface temperature 140–1
- Meisenheim, Lake **10**, **11**
- Mesozoic
- global terrestrial productivity 17–30
- temperature history 2
- Messel oil shale, Germany 7
- Messinian Salinity Crisis, Mediterranean Sea 65–6, 161, 167, 168
- Miocene, Early, flora, Bilina, climatic oscillations vs environmental changes 90–2
- Miocene, Late, pre-evaporitic diatoms, Lorca Basin (SE Spain) 65–76
- diatom biostratigraphy 72
- environmental evolution 74–5
- geological setting 66–7
- material/methods/results 67–72
- abundance changes within diatom assemblages 71–2
- abundance of siliceous microfossil groups 68–9
- biostratigraphic results 69–71
- palaeoecology and productivity 72–4
- Miocene, Late, sedimentation (West Hungary) 79–87
- changes of temperature and precipitation 83–4
- correlation of sedimentation and climate cycles 86–7
- cyclicity of sediments and sedimentary environment 84–6
- methods 79–82
- calculation of precipitation 81
- calculation of temperature 80–1
- magnetostratigraphical correlation 81–2
- sedimentation 82–3
- Miocene, Transylvanian Depression, fossil record 55–62
- Early Miocene 55–8
- Late Miocene 62
- Middle Miocene 58–62
- Miocene–Holocene, large mammal turnover pulses 161–8
- Miocene–Pliocene transition 161
- Modular Ocean Model Array (MOMA) 142
- Monte Pellegrino faunal complex, Sicily 173, 176–7
- Moravian stage, Transylvania, Miocene 60
- Nemegt Formation 43
- Neogene glacial trends *see* Mediterranean region, large mammal turnover pulses
- Neptunea contraria* 115
- net primary productivity (NPP)
- CO₂ influence on predictions **23**
- SDGVM solutions **22**, 25–30
- Odernheim, Lake 9
- Oligocene, Late, Central Europe, Tertiary plant assemblages 92–3
- ostracods, Pleistocene–Holocene changes (Gaeta Bay, Tyrrhenian Sea) 101–3
- Ottungian stage, Transylvania, Miocene 57
- Pacific
- Antarctic, diatom abundances **71**
- Equatorial, diatom abundances **71**
- Palaeogene lake strata, Carboniferous–Permian transition, lake sediments, lamination and primary production 7–8
- Palaeozoic, temperature history 2
- Pannonian Basin, Miocene, West Hungary 79–87
- Pannonian stage, Transylvania, Miocene 62
- Paratethys, Central, chronostratigraphy and biochronology **57**
- Permian
- Lower (Autunian) lakes, sediment lamination and primary production 8–12
- palaeogeography, Northern Hemisphere **13**
- temperature history 2
- phytoplankton succession
- Lake Constance **7**
- Transylvania 55–62
- see also* diatoms
- Pianetti–Castello faunal complex, Sicily **174**, 175, 179
- Picentini Massif, Italy 151
- Pleistocene shelf assemblages, SE Sicily, BGs, cooling evidence 113–19
- materials and methods 114–15
- results 115–18
- section description 113–14

- Pleistocene–Holocene, Gaeta Bay, Tyrrhenian Sea 95–107
 calcareous nannofossils 96–100
 materials and methods 95–6
 ostracods 101–3
 palynology, pollen assemblages 103–6
 planktonic foraminiferans **97–9**, 100–1
- Pleistocene–Holocene vertebrate dispersal events, Sicily 171–81, **174**
 dispersal routes and comparison with Italian peninsula assemblages 175–6
 ecological and environmental–climatological characteristics of mammal assemblages 176–80
 Castello faunal complex 179
Elephas mnaidriensis faunal complex 177–9
 Holocene 180
 Monte Pellegrino and *Elephas falconeri* faunal complex 176–7
 Pianetti–Castello complex 179
 taphonomic data 176
 highstand coastline relationships 173–5
Elephas falconeri faunal complex 173–5
Elephas mnaidriensis faunal complex 175
 Monte Pellegrino faunal complex 173
 Pianetti–Castello complex 175
- Pleniglacial Alpine ice-shield and deglaciation, Austria 209
- pollen analysis, Acerno Basin, S Italy, palaeo-lacustrine succession (Middle Pleistocene) 151–8
 climate and vegetation, present-day 152–5
 data display 155–6
 description and interpretation of results 156–8
 diagram zonation 156–8
Pinus role 158
 geography and geology 151–2
 materials and methods 155
- pollen analysis, Austrian cave deposits 208–9
- pollen analysis, Gaeta Bay, Tyrrhenian Sea, Pleistocene–Holocene changes 102–6
- precipitation
 calculation methods, Miocene, Late, West Hungary 81
 Maastrichtian, CLAMP predictions 50–1
- Proterozoic, temperature history 2
- Pseudamussium septemradiatum* 115
- Quaternary *see* Pleistocene–Holocene
- Recent lake sediments, lamination and primary production 6–7
- rhinoceros, Miocene, Transylvania 58
- Romania *see* Transylvanian Depression
- RuBisCo, ¹³CO₂ values 29
- Ruscinian mammal turnover pulse 161
- Ruthweiler, Lake 9
- Saar–Nahe Basin, Germany 8–9, –14
- Santonian, Late, Cretaceous planktonic Foraminifera 38–40, **39**
- sapropels
 defined 137
 formation *see* Mediterranean Sea, sapropel formation
- Sarmatian stage, Transylvania, Miocene 61
- sea-levels, rate of change 1
- Serrata Formation, Varied Member, Lorca Basin (SE Spain)
 biostratigraphy **69**, 71
 diatoms 65–76, **67**, **70**
 abundance changes 71, **72**
 biogenic cycles **74**
- Serravalian stage, Transylvania, Miocene 61
- Sheffield *see* University of Sheffield Dynamic Global Vegetation Model (SDGVM)
- Sicily
 Pleistocene shelf assemblages, BGs, cooling evidence 113–19
 Pleistocene–Holocene vertebrate dispersal events 171–81, **174**
 Uzzo cave 180
- Spain, Lorca Basin, diatoms 65–76
- Spirorbis* spp., BGs 116–17
- Spisula elliptica* 115
- Stephanian–Autunian boundary
- temperature
 calculation methods, Miocene, Late, West Hungary 80
 global history 2
 Maastrichtian
 CLAMP predictions 48–50
 latitudinal gradient 511–2
- terrestrial productivity *see* global terrestrial productivity
- Tertiary plant assemblages, climatic oscillations vs environmental changes 89–93
- Tetraclinis* (Tertiary flora) 89
- Tortonian sediments, Serrata Formation 66
- Transylvanian Depression, Miocene, fossil record 55–62
- Tyrrhenian Sea, Pleistocene–Holocene changes 95–107
- UK universities
 Global Atmospheric Modelling Program (UGAMP) 18
 University of Sheffield Dynamic Global Vegetation Model (SDGVM) 18, 24–5
 NPP and LAI **22**
 shema **21**
- Uzzo cave, Sicily 180
- Vallo di Diano Basin 151, 152
- vapour pressure deficits (VPDs) 30
- Variscan orogenic belt –14
- vertebrates
 cave deposits, SE Austria 199–211
 large mammal turnover pulses, Mediterranean region 161–8
 Pleistocene–Holocene dispersal events, Sicily 171–81