

Index

Page numbers in *italic* denote figures. Page numbers in **bold** denote tables.

- abiotic method 377
- aborted reversals 4, 5, 6
 - outer Great Barrier Reef 279
- Pringle Falls 261, 262, 270–271, 273–275
- accretion 193
- acquisition behaviour 16
- Adriatic Promontory 112
- aeolian component 378, 379, 387, 389
 - dust proxy 326, 333–335, 336, 338
- AF *see* alternating-field demagnetisation
- age control, magnetostratigraphy 138, **139**, 141, 142, 144, 145
- age-depth model 247
 - Lake Kalimpaa 250, 254–257
 - Nankai Trough 229–230, 232–240
 - ODP Hole 711A 105, 107
 - Stirone section 317–320
- air-fall volcanic ash 112, 123, 193, 194–195
- Alashan Block 150, 152, 186
- allocyclic forcing mechanism 325
- alternating-field demagnetisation
 - Cupido Formation, Mexico 330, 331
 - IODP Site U1333 17, 18
 - Lake Kalimpaa 251, 253
 - Monte Cagnero 83, 84
 - Nankai Trough 192–193, 195, 197, 198, 199, 223
 - ODP Hole 647A 32, 33, 34
 - ODP Hole 711A 100, 101, 103
 - outer Great Barrier Reef 287, 288
 - Pringle Falls 266, 268
 - Stirone section 312, 313, 314, 315
 - Tibetan Plateau 156
- AMS *see* anisotropy of magnetic susceptibility
- analysis methods, magnetic cyclostratigraphy 329–330
- anhysteretic remanent magnetization 6–7, 15, 16, 18
 - as palaeoclimate proxy 326
 - Cretaceous 330, 331–337
 - Holocene 248, 252, 254
 - Permian 378
 - Pliocene–Pleistocene 309, 316
- anisotropic behaviour 294, 346
- anisotropy in geomagnetic trajectories 303, 306
- anisotropy of magnetic susceptibility 6, 262
- anisotropy of magnetic susceptibility in rhythmites 355–370
 - data and methods 358, 360
 - sediment transport 357
 - tensor axes 360, 364
- anoxic conditions 321
- Antarctic glaciation 98–99
- Apache Mountains sections 377, 379, 384, 385, 387–390
- Apennines (Northern), cyclostratigraphy 309–321
- Apparent Polar Wander Path 6
- Ar/Ar date 275, 288, 294
- archives, Lake Kalimpaa 247
- ARM *see* anhysteretic remanent magnetization
- astrochronology 328
- astronomical calibration **368**, 370, 379
 - astronomical forcing cycles 7–8
 - astronomical harmonic features 355, 363–367
 - astronomical parameters 360
 - astronomical signal, Garcia Canyon 335–336, 338
 - astronomical time scale 341
 - Atlantic (NW), circulation 30
 - atmospheric circulation 334, 338
 - atmospheric CO₂ 377
 - Australia, dating latest Holocene 247
 - authigenic ferromagnetic minerals 344
 - auto-cyclic forcing mechanism 325
- backarc spreading 193
- bacteria 343, 344
- bar-log format 345, 346, 348, 380, 381, 382
- Bayesian inversion 295, 297
- bentonite 112
- bioevents 91–92
 - foraminifera 85, 87–89
 - nanofossils 88–89, **99**, 103, 105
- biogenic components 343
- biogenic magnetite 287–288
- biomagnetostratigraphy, integration high to low latitudes 29–74
- biosilica accumulation rate 68, 69, 71
- biostratigraphic and palaeomagnetic age datum **233–235**, **237–239**
 - Magnetic Reversal Polarity Timescale *Fig.10*
 - opposite page 56
- biostratigraphy
 - Cretaceous 327–328
 - ODP Hole 647A 34–38, 39–47, **48–49**
 - ODP Hole 711A 105–206
 - Palaeogene 113–114, 121
 - Permian, Mid 376–377, 389–390
 - Pleistocene 311, 313, 316
- biotite-rich layer 112, 123
- Blake event 262
- Blake excursion 288, 289
- block-floating model 169
- Bond cycle 367
- bootstrap method 157, 159
- Brazilian lavas, virtual geomagnetic pole paths 293–306
- Brunhes Chron correlation 273–274, 275
- Brunhes Chron excursion 288
- bulk low-field mass specific magnetic susceptibility 341, 343
- calcarenite 312, 316, 319, 320
- calcite compensation depth 97, 98, 107
- Capitanian, global stratotype 376, 384, 385, 387, 390, 392
- carbonate 107, 112, 343
- carbonate cyclostratigraphy 309
- carbonate platforms, cyclicity 325–329, 332–338
- carbonate sediments, magnetostratigraphy 280, 282
- carbonate–carbonate-free correlation 32, 68, 69, 71, 72

- carbonates, pelagic 82, 112–113, *116*, *118*, 119–121
 characteristic remanent magnetization (ChRM) 3
 Guide Basin 137, 138, *140*
 Jiuquan Basin 177–178, 180
 Lake Kalimpa 248
 Monte Cagnero 83, 87, 89, 100, *103*, *105*
 Nankai Trough 192–193, 195–199, 223, 226, 236,
 240–241
 ODP Hole 647A 34
 outer Great Barrier Reef 287, 289
 Pringle Falls 265–266
 rhythmites 356, 360
 Stirone section 312, 313
 Tibetan Plateau 157–158
 chemical remanent magnetization 3
 chemoherm 311, 312, 318, 319
 Chico Canyon 326–327, *331–333*
 ChRM *see* characteristic remanent magnetization
 chronology, magnetism and age 280
 chronology, radiocarbon 250, 252–253
 chrons 3–4, 273–275
 ODP Hole 647A 50–65
 chronstratigraphy and magnetostratigraphy
 susceptibility 379
 climate and geology 247–248, 326
 climate cycles in susceptibility values 343–346,
 348, 378
 climate cycles, encoding 320–321
 climate proxy 8, 309, 326–327, 341–342, 370, 379
 climate, Cenozoic 13
 Eocene–Oligocene 79, 81, 92, 97–99
 climate-driven cycles 351
 coal 152
 coercivity 196
 Lake Kalimpa 250, 254
 outer Great Barrier Reef 282, 283
 Pringle Falls 264–265
 Colleen Canyon section 383, 385–387, 392
 collision, India–Asia 8, 151, 152, 166, *167*, 168, 173
 collision, Proterozoic 152
 condensed sequence 325, 337, 348, 351
 Contessa, pelagic succession 112–117, *119*, 121
 cooling 81, 151
 coral reef 280
 coring, disturbance 196–197
 correlation, ODP Hole 711A to GPTS 106
 couplet thickness 358, *361*, *362*, 370
 Cretaceous–Palaeogene boundary 117, 344
 integrated chronostratigraphy 111
 crust, flow 151
 crust-floating model 167–169
 Cupido Formation, magnetic cyclostratigraphy
 325–338
 analysis methods 329–330
 anhysteretic remanent magnetization 331–337
 magnetic mineralogy 330–331
 sample collection 329
 stratigraphy 326–328, *329*
 time series methods 330
 Curie point 280, 282, 287
 Curie temperature 264, 265, 282, 285
 determination 199, 223–224, 225, **227**
 cyanobacteria 343
 cyclostratigraphy 309–321, 325–338
 data analysis, magnetostratigraphy 196–197
 dating and geomagnetics 2, 3–6, 8
 see also palaeomagnetic
 Day plot 254, 265, 266
 debris flow 163, 166, 167
 declination 8, 21, 22–23, 24, 196
 and age 185, 186
 Lake Kalimpa 252, 255, 256
 magma flows 296
 outer Great Barrier Reef 287, 288–289
 Pringle Falls 67–269, 270–271
 deep-sea sediments, magnetostratigraphy 13–26
 deformation and magnetostratigraphy 149–169
 deformation rates, Quaternary 173
 deformation, timing of 241
 Delaware Mountains 377, 392
 demagnetization 18, 20
 demagnetization experiments 197–199, 265–268
 denudation rate 146
 deposition period, rhythmites **369**
 depositional cyclicity, anhysteretic remanent
 magnetization 336–337
 depositional environment
 Guide Basin 135, 145
 Jiuquan Basin 181
 depositional hiatus, Stirone section 321
 depth scale 20, 22
 detrital component 378, 379, 380, 387, 389
 detrital remanent magnetization 3
 diagenesis 6, 321, 381
 and magnetic susceptibility 344
 diamagnetism 379, 384
 diatomaceous sediments 263, 266, 275
 diatoms, ODP Hole 647A 34, **49**, 65
 dinocyst marker species **43–44**, 56
 dinoflagellate cysts
 ODP Hole 647A 34
 Umbria–Marche 113, *116*, *118–120*, 121, 128
 dipolar field 294, 303
 dipole field, diminution 274–275
 directional records, polarity excursions 262
 drilling-induced magnetization 197, 199
 drilling-induced remagnetization 34
 dropstones, Permo–Carboniferous 357, 358, 359
 dynamo model 294

 earthquakes 191–192, 193
 eccentricity 7, 326, **367**, **368**, 387, 388
 orbital 335, 337, 338
 eccentricity cycle 72
 Ordovician 342, 347, 348
 identified at outcrop 350, 351
 Permian 360, 363, 379, 392
 Pliocene–Pleistocene 315, 317, 320
 El Nino Southern Oscillation 245
 environment proxy 326, 333–335, 338, 356, 366
 see also aeolian and climate
 environmental magnetism 6–7
 Eocene Thermal Maximum 73
 Eocene–Oligocene boundary 81–82, 89,
 90, 98, 107
 North Atlantic 31, 35, 57, 71–72
 Eocene–Oligocene Climatic Optimum *Fig. 10*
 opposite page 56

- Eocene–Oligocene Transition 8, 30, 71, 73
 geology 31, 35
 eolian *see* aeolian
 eustacy 325, 341, 344, 346, 378, 380
 evaporite 327, 367
 excursions 4, 5, 6
 equatorial Pacific 24–26
 Icelandic 302
 outer Great Barrier Reef 279, 287–289
 excursions, Pringle Falls 261–275
 Brunhes Chron correlation 273–274, 275
 demagnetization experiments 265–268
 hysteresis experiments 264–265, 266
 rock magnetic experiments 264–269
 sampling procedure 263–264
 virtual geomagnetic pole paths 269–274
 extinction, *Hantkenina* spp 72
 extinction, mass 344, 377
- facies analysis, magnetostratigraphy 133, 142–146
 fence diagrams in magnetostratigraphy 133–146
 ferromagnetic grains 329, 378
 field sampling method, magnetostratigraphy 379
 Fischer plot 157, 159, 329, 332
 fission-track data 226, 232, 236, 240
 floating-point time scale model 387–391
 foraminifera
 Eocene–Oligocene 83, 85, 87–88
 Palaeogene 113–127
 deep sea 35, 38, 48–49, 66
 Pliocene–Pleistocene 318
 foreland basin 150, 152, 163, 165, 166, 169
 fossil mammals 135, 158, 160
 Fourier phase estimator 301
 Fourier transform results
 Middle Permian 380–382, 387, 388–389, 390
 Ordovician 347, 348
- GAD *see* geocentric axial dipole
 gamma-ray attenuation density data 70, 71
 Garcia Canyon 326–327, 331, 332, 333
 geocentric axial dipole, Holocene 253, 256
 geodynamo processes 261, 262
 geology
 Guide Basin 133–137
 Itararé Group 357–358
 Jiuquan Basin 174, 177
 Lake Kalimpaa 247–248
 Monte Cagnero 81–82
 Nankai Trough 193
 ODP Hole 647, Labrador Sea 30–31
 ODP Hole 711A, Indian Ocean 99–100
 Pringle Falls 262–263
 Stirone section 310–312
 Tibetan Plateau 150, 151–154
 Umbria–Marche 112
 geomagnetic excursions 4, 5, 6
 Oligocene–Miocene 24–26
see also excursion
 Geomagnetic Instability Time Scale,
 defining excursions 275
 Geomagnetic Polarity Time Scale (GPTS) 1, 2, 89, 279
 Guide Basin 138, 140
 Jiuquan 180, 181
 Nankai Trough 229
 ODP Hole 711A 99, 106–107
 Site U1333 21, 24
 Stirone section 315, 318
 Tibetan Plateau 158, 160, 161
 geomagnetic pole paths 272–273
 geomagnetic reversals, discovery of 1–3
 GITS *see* Geomagnetic Instability Time Scale
 glacial changes and anhysteretic remanent
 magnetization 326
 glacial–interglacial periodicities 363
 glaciation, Gondwana 355
 glaciogenic rhythmites 357
 glaciomarine deposition 358
 Global boundary Stratotype Sections
 and Points (GSSP) 375, 377, 383
 Capitanian–Wordian 376, 383–385, 387, 390, 392
 Eocene–Oligocene boundary 81
 Kungurian–Roadian 376, 382, 386, 391, 392
 Rupelian–Chatian 82, 85, 121
 Global Positioning System (GPS) 6, 168–169, 173
 global sequence boundary 328
 global stratigraphy 377–378
 global warming 355
 Gloria Drift 30
 Gondwana glaciation 355
 Gondwana I Supersequence 356, 357
 GPS *see* Global Positioning System
 GPTS *see* Geomagnetic Polarity Time Scale
 GRA *see* gamma-ray attenuation
 grain size 253, 265, 289, 309, 330
 grain size and magnetization 196
 grain size, experiment 280, 282, 283, 287
 granulometry 331, 358
 gravel composition 162, 163, 164
 gravity collapse 149
 Great Barrier Reef (outer), marine sediments 279, 281
 greenhouse gases 81
 gregite 315, 321
 GSSP *see* Global boundary Stratotype Sections and Points
 Guadalupian Mountains National Park 375
 Guide Basin, NE Tibet, magnetostratigraphy
 3D analysis 138–140, 142
 age control 138
 depositional environment 135, 145
 geology 133–137
 methods 137
 rotation 186
 sedimentary facies 142–146
 sedimentation rates 138, 139, 145, 146
 gypsum 154, 160, 161, 164
- Hallstatt solar cycle 365–367, 370
 harmonic features 363, 365, 370
 Heinrich warming events 367, 370
 hematite 157, 178, 197, 224
 Hexi Corridor Basin 149, 151, 152, 153, 167
 Hexi Corridor, rotation 173–174, 183, 186
 Hocke's estimator 301
 Holocene (latest) dating 247, 257
 Hongshuiba, rotation study 174, 177, 178,
 180, 183, 185
 Hopkinson Peak 287
 hot-house fluctuations 367

- hypothermals 73
hysteresis loop parameters 224, 228, 229
granulometry 16, 18, 26, 103–105, 264–265, 266
measurements 100, 196, 250, 282, 283, 284
Milankovitch cycles 330, 331
- ice-house, Cenozoic 8
Iceland Basin, excursions 273, 275
Icelandic Magmatic Province, pole analysis 302–303, 305
ice-sheet development 321
ice-sheet Permo-Carboniferous 357, 358
illite 385
ilmenite 224
inclination *Fig 10* opposite page 56
Holocene 252, 255, 256
Miocene–Pliocene 196, 197, 199, **223**, 226
Oligocene–Miocene 21, 22–23, 24
Pleistocene 287, 288–289
Pliocene–Pleistocene 266–269, 270–271
inclination, Cretaceous magma flows 296
integrated magnetobiostratigraphy 50, 52, 54, 55
integrated magnetostratigraphy 8, 29, 79, 97, 111
Integrated Ocean Drilling Program (IODP) 13, 14
322 Seismogenic Zone Experiment Expedition 191–241
325 Hole M0058A magnetic experiments 280–287, 289
Site U1333 (Pacific) 17–20, 21, 22–23
see also Ocean Drilling Programme
- intensity 4–6
outer Great Barrier Reef 287, 288–289
Pringle Falls 262, 267, 269–271
see also palaeointensity
- International Commission on Stratigraphy 377
International Union of Geological Sciences 377
IODP *see* Integrated Ocean Drilling Program
IRM *see* isothermal remanent magnetization
iron sulfide minerals 315, 316, 321
- isostatic rebound 149, 151
isothermal remanent magnetization 3, 7
Cupido Formation Mexico 330, 331
IODP Site U1333 15, 16
Jiuquan Basin 179
Lake Kalimpa 250, 252
Nankai Trough 196, 199, 223–224, 226
ODP Hole 647A 34, 35
ODP Hole 711A 100, 102, 107
Pringle Falls 264–265
Stirone section 312, 313, 315, 316
- Itararé Group, geology 357–358
Itu rhythmites, Carboniferous 358, 360–366, **367–369**
- jack-knife analysis 159, 160
Jiuquan Basin, Neogene rotation 173–187
depositional environment 181
geology 174, 177
sections 178, 180, 183, 185–186
Jiuquan, foreland basin 152, 163, 165, 166, 169
- K1 *see* spectral analysis of maximum axis of anisotropy of magnetic susceptibility
K–Ar age 262
Kii Peninsula, earthquakes 192
Kope Formation, Milankovitch cycles 341–351
composite reference section 345, 348–351
lithostratigraphy 342–344
- K–Pg *see* Cretaceous–Palaeogene
K–T boundary 111, 117, 344
Kungurian–Roadian global stratotype 376, 382, 386, 391, 392
- laboratory methods *see* methods/laboratory
Labrador Sea 29, 30, 72
lacustrine sediments 262–263, 265, 266, 275
Lake Kalimpa, radiocarbon chronology evaluation 245–257
age-depth model 250, 254–257
archive 247
chronology 250, 252–253
climate and geology 247–248
materials and methods 248–250
palaeomagnetic data 253–254
Laojunmiao section 174, 177, 178, 183, 185
Laschamp Excursion 288, 289, 290
Last Glacial Maximum 279, 280
latitude, high to low integration 29–74
latitude/longitude, secular variation 293–295, 297–298, 304
- limestone
magnetic susceptibility 378, 384
magnetostratigraphy susceptibility 379, 382
thermomagnetic susceptibility 386
Ordovician 343, 345, 346, 348, 350
- loess 135
low-field magnetic susceptibility 309–321, 377, 380
low-temperature properties 224, 230, **231**
lysocline 73
- Madingley Rise 97
magnetic foliation 357
magnetic granulometry 331
magnetic lineation 357
magnetic measurement procedure 195–196
magnetic mineralogy 6
Cupido Formation 330–331
Guadalupe Mountains 384–385, 386
Northern Apennines 309, 313, 315, 321
magnetic palaeointensity 4–6
see also intensity
magnetic polarity record, Nankai Trough
Hole C0011B **200–211**, 229–230, **233–235**
Hole C0012A **212–223**, 236, **237–239**
magnetic polarity reversal stratigraphy
ODP Hole 647A 47, 50–67
Stirone section 311, 313
Magnetic Reversal Polarity Timescale *Fig 10*
opposite page 56
magnetic susceptibility
experiment 280, 282, 283
Ordovician 341–344
measurements 345–346
see also anisotropy of magnetic susceptibility
magnetite 85, 102, 105, 287
Apennines 315, 316, 321
Indonesia 254
Mexico, NE 326, 329, 338
Nankai Trough 196, 223, 224
Oregon 266
Pacific sediments 18, 20, 26
Tibet (NE) 157, 178

- magnetite, Curie temperature 264, 265, 275, 380, 385
 magnetite, loss of 344, 378
 magnetization saturation (Ms)
 Lake Kalimpa 250
 Pringle Falls 264, 266
 outer Great Barrier Reef 282, 283, 284–287
 magnetization saturation remanence (Mrs)
 Lake Kalimpa 250
 Pringle Falls 266
 outer Great Barrier Reef 282, 283, 284–287
 magnetobiochronological summary 50, 52, 54, 55
 magnetobiostratigraphy, Eocene–Oligocene, Monte Cagnero 79–92
 age calibration refinement 91–92
 geomagnetic polarity time scale 89–90
 methods 83–84
 polarity 84–85
 sedimentation rate 90–91
 magnetobiostratigraphy, Palaeogene
 pelagic succession 111–128
 magnetosomes 331
 magnetostratigraphic analysis
 3D 138–140, 142
 Stirone section 312
 magnetostratigraphy
 and deformation 149–169
 basin analysis 133–146
 conference volume 7–8
 equatorial Pacific 17–20, 21, 22–23
 Indian Ocean site 97–107
 methods 137
 polarity time scale 3–4
 magnetostratigraphy susceptibility, Middle Permian
 stratotype
 biostratigraphy 376–377
 climate 379
 floating-point time scale model 387–391
 Fourier transform and multi-taper analysis 380–382, 387, 388–389, **390**
 general comments 378, 380
 global stratigraphy 377–378
 graphic comparison 385–387, 390
 sampling and measurement 380–382
 sedimentary rocks 378–379
 magnetostratigraphy susceptibility, Ordovician 345, 346–349, 351
 magnetotactic bacteria 326, 331
 magnetotelluric data 168
 mantle 151, 168
 Massignano, pelagic succession 112, 113, 116, 119–120
 maximum angular deviation, Lake Kalimpa 248, 252, 253–254
 McElhinny's tilt test 159, 179
 MECO *see* Middle Eocene Climatic Optimum
 median destructive field, Lake Kalimpa 253–254
 Mediterranean, circulation 321
 meteorite impact 344
 methane expulsion 312
 methods/laboratory
 chronology evaluation 248–250
 cyclostratigraphy 194–197, 330, 312–315
 magnetobiostratigraphy 83–84, 112–114
 magnetostratigraphy 100, 137, 194–197
 polarity excursions 263–269
 rock magnetism 264–269, 280–287, 289, 329–330
 rotation 177
 spectral analysis and anisotropy 358, 360
 thermomagnetic susceptibility 380
 time series analysis 344–346, 379–382
 uplift and deformation 156–157
 virtual geomagnetic pole paths 294–298
 microfossil bioevents **40–42**
 Middle Eocene Climatic Optimum (MECO)
 Indian Ocean 98, 99, 107
 Italy 81
 Labrador Sea 52, 68, 69, 71, 72, 73
 Middle Permian, Guadalupian Series,
 stratotype 375, 377
 mid-ocean ridges 1
 Milankovitch bands 379, 381, 387, 392
 Milankovitch cycles
 Cretaceous 313, 315, 317 *see also below*
 Permo-Carboniferous 355, **367, 369**
 Milankovitch cycles, Lower Cretaceous 325–338
 anhysteretic remanent magnetization 331–337
 data and methods 329–330
 magnetic mineralogy 330–331
 Milankovitch cycles, Upper Ordovician 341–351
 composite reference section 348–351
 lithostratigraphy 342–344
 magnetic susceptibility 341–344
 measurements 345–346
 missed beat, peritidal 325, 337
 molasse 144, 152, 186
 monsoon 245
 African 320–321
 and isostatic rebound 149
 Monte Cagnero, Eocene–Oligocene section 79–92
 biostratigraphy 83–84, 85, 87–89
 geomagnetic polarity time scale 89–90
 palaeomagnetism 83, 84–85
 polarity zonation 84–85, 87
 sedimentation rate 90–91
 stratigraphy 81–82, 112, 113, 116, 118, 119–121
 multi-proxy investigations, Lake Kalimpa
 247, 254, 256
 Multisensor Core Logger 280, 282
 multi-taper spectral estimation 380–382, 388–389, **390**
 Multi-Taper results 347

 Nankai Trough, Expedition 322 IODP 192, 193
 Hole C0011B 194, 224–232, 241
 age datum **233–235**
 polarity **200–211**, 229–230
 Hole C0012A 224–226, 229–231, 240, 241
 age datum 236, **237–239**
 polarity **212–222, 223**
 Nankai Trough Seismogenic Zone Experiment
 (NanTroSEIZE)
 age-depth model 229–230, 232–240
 data analysis 196–197
 depositional environment 194–195
 geology 193
 laboratory methods 194–197
 palaeomagnetic results 197–199, **200–222, 223**
 rock magnetic characterization 199, 223–226
 stability tests 226–228, **231**

- nannofossil ooze 15–16, 102
- nannofossils
 Miocene 194, 232, **233–235**, **237–239**, 240
- nannofossils, Palaeogene
 Monte Cagnero 83–84, 88–89, 107
 ODP Hole 647A 31–32, 34, **36–37**, **45–47**, 65
 Umbria–Marche succession 113–127
- natural remanent magnetisation (NRM) 3
 deep sea sediments 15, 17–18, 32, 100–101, 102
 Guide Basin 137
 Lake Kalimpa 248, 252
 Monte Cagnero 83, 84
 Nankai Trough 197, 198
 outer Great Barrier Reef 282, 283, 287, 288
 Pringle Falls 264–269
 Stirone section 313, 314
- Neogene 318, 319
 Neogene basin infill 134
 Neo-Tethys gateway 81, 99
 Neo-Tethys Sea 152
 Newberry volcano 262, 263, 275
 Nongchunhe Valley 136, 138, 140,
 142, 145, 146
- North Atlantic Ocean 29, 30
- NRM *see* natural remanent magnetization
- Nyquist frequency 296, 297
- obliquity orbital cycle
 Cretaceous 326, 347
 Late Neogene 310, 315, 317, 318, 319, 320
 Mid Permian 387, 392
 Ordovician 348, 349, 350, 351
 Permo-Carboniferous, Brazil 360, 363
- ocean circulation 30, 320–321
- Ocean Drilling Programme, Hole 647A 29–74
 age model and errors 38, 39, **40–42**
 age model and new datum **58–64**, 67–68, 71–73
 biostratigraphy 34–38, 39–47, **48–49**
 chronology 31–32
 geology 30–31
 magnetic polarity reversal stratigraphy 47, 50–67
 palaeoceanography 72–73
 palaeomagnetism 32–34
 sedimentation rates 68–71
 seismic line 31
 spectral analysis 38, 71–72
 stable isotopes 38, 72
- Ocean Drilling Programme, Hole 711A 97–107
 age-depth model 105, 107
 biostratigraphy 105–206
 geology 99–100
 methods 100
 palaeomagnetic polarity zonation 100–102
 rock magnetic properties 102–105
 sedimentation rate 106, 107
see also Integrated Ocean Drilling Program
- Oceanic Anoxic Event 328, 335, 338
- oceanic magnetic anomalies 1
- ODP *see* Ocean Drilling Programme
- Olduvai Chron 312, 316
- Oligocene–Miocene boundary 23, 26
- Oligocene–Miocene magnetostratigraphy 13–26
- orbital cycles, correlation 315–317, 318
- orbital eccentricity 313, 326, 335, 337, 338
- orbital frequency 348
- orbital variability 309
 Ordovician 347, 348, 350, 351
- oxygen isotope 72, 97–99, **249**, 252
 and climate change 79, 81
- Pacific Equatorial Age Transect 13
- Pacific, equatorial, deep-sea investigation 13–26
- palaeoceanographic events, correlation 29–72
 age model 72–74
- palaeoceanography 72–73
- palaeoclimate 309
 Eocene–Oligocene 97–99
 Permo-Carboniferous 365, 367
- palaeoclimate proxy 326, 357, 370
- palaeoclimate, astronomical forced insolation 7
- palaeocurrent direction 163, 164, 358
 and anisotropy of magnetic susceptibility 357
- palaeo-depth 31, 82, 97
- palaeoenvironmental studies 245, 357
- Palaeogene, oceanic red beds 120, 128
- Palaeogene, pelagic composite succession 111–128
 integrated stratigraphy 120, 121–128
- palaeogeographic reconstruction 98, 133, 334
- palaeointensity 4–6, 8
 Lake Kalimpa 247, 254, 255, 256
 polarity excursions 262
see also intensity
- palaeomagnetic
 biostratigraphic age datum 39, **233–235**, **237–239**
 chronology evaluation 253–254
 direction summary **175–176**, **182–184**
 high resolution 247
 polarity zonation 100–102
 reference directions, Eurasia **184**
 sampling 194–195
 secular variation 247, 257
 sediment data **200–223**
- palaeomagnetic dating 133, 151, 158–161, 185–186
 ODP Hole 647A 32–68
 IODP Nankai Trough 232–240
- palaeosecular variation, Lake Kalimpa 247, 253
- paramagnetic grains 330, 367, 378, 379, 380
- paramagnetic phases 343, 344, 346
- Paraná Basin, magnetism and sedimentary cycles 355,
 357–358
- Paraná Magmatic Province 295
- pDRM *see* post-depositional remanent magnetization
- pelagic succession 81–82, 111–128
- periodogram 296, 298–299, 301, 304
- peritidal facies 325, 328, 337
- Permo-Carboniferous 360, 363, 367
- Philippine Sea Plate 192, 193
- plate boundary slip 191–192
- plate-driven eustasy 346
- playa 154, 161, 164
 Pliocene–Pleistocene 310, 315, 317–321
- Pliocene–Pleistocene, Stirone section 309–321
- polarity 1–3
 Hole C0011B **200–211**, 229–230, **233–235**
 Hole C0012A **212–223**, 236, **237–239**
- polarity and inclination 21, 23
- Polarity Chron, reversal boundary 73

- polarity excursions 4–6, 24–26, 262, 273, 275, 288–290
see also excursion
- polarity interval 193, 196, 226, 229, 236
- polarity reversal 8, 261, 279, 294, 312, 317
 boundaries 310
 data **22**, 23
 theory of 3–4, 5
 timescale *Fig 10* opposite page 56
- polarity zones
 Guide Basin 138, **139**
 Tibetan Plateau 158–160
- pole paths 272–273
 comparative analysis 302–303, 305
 Early Cretaceous lava, Brazil 293–306
- Popper-Bayes paradigm 295
- post-depositional remanent magnetization 3, 312, 313, 315, 316
- precession
 Cretaceous, Lower 326, 330, 335–336
 Mid Permian 387, 392
 Ordovician 347, 348, 350, 351
 Permo-Carboniferous 360, 363, 367
 Pliocene–Pleistocene cycle 310, 315, 317–321
- Pringle Falls, excursion 261–275
 age 263, 273–274
 geology 262–263
 laboratory experiments 263–269
 virtual geomagnetic pole paths 269–274
- pseudo-single domain 16, 18
- pyrite 343, 344, 378
- pyrrhotite 321
- Qilian Shan, magnetostratigraphy 150, 151–154, 163–167
- radiocarbon chronology, evaluation 245–257
- radiocarbon dating 280, 288
 Lake Kalimpa 247, **249**
- radiolarian chert 112
- radiometric age 274
 Ar/Ar 275, 288, 294
 K–Ar 262
 U–Th 288
 U–Th/He 151
- red beds, Palaeogene 120, 128, 134, 180
- reef carbonate 287–288
- relative palaeointensity 8
- remanent magnetization 3, 179, 378, 379
- results 313–315
- reversal *see* polarity
- rhythmites, Carboniferous–Permian 355–370
- rigid block 168, 169, 173
- Rio do Sul rhythmites, Permian 358, 359, 360–363, **367–369**
- RM *see* remanent magnetization
- Roadian, global stratotype 376, 382, 383, 391, 392
- rock magnetic characterization 194, 199, 223–226
- rock magnetic cyclostratigraphy, Pliocene–Pleistocene
 age model 309–311, 317–320
 climate cycles encoding 320–321
 geology 310–312
 methods 312–315
 orbital cycles correlation 315–317, 318
- rock magnetic experiments 179
 IODP 325 Hole M0058A 280–287, 289
 Pringle Falls 264–269
- rock magnetic properties 17–20, **227**
 ODP Hole 711A 102–105
- rotation, Neogene 173–187
 direction of 183, 185–186
 laboratory methods 177
 palaeomagnetic results 177–180, 183, 185–186
 sample collection 174
 vertical axis 173, 174
- run-off 320, 321
- salinity 320–321
- sample collecting
 directional geomagnetics 263–264
 magnetic cyclostratigraphy 137, 329
 magnetostratigraphy 156–158, 194–195
- sapropels 312, 319, 320, 321
- saturated isothermal remanent magnetization
 Cupido Formation 331
 Lake Kalimpa 250, 252
 outer Great Barrier Reef 282
- saturation remanent magnetization (M_r) 196, 264
- sea-level change 279, 321, 328, 343, 344
- sea-level oscillation 325, 333, 336, 337
- secular variation 5, 293–295, 297–298, 302–304
 Lake Kalimpa 247, 253
- sediment provenance 146
- sediment, low-temperature rock magnetic measurements **231**
- sedimentary facies, Guide Basin 142–146
- sedimentary rock, geomagnetic variations 293
- sedimentary rock, magnetic susceptibility 378–379
- sedimentation rate 23
 Guadalupe, Texas 382, 385–387, 390, 391, 392
 Guide Basin 138, **139**, 145, 146
 Kope Formation/Ordovician 342, 348–351
 Lake Kalimpa 253, 256–257
 Monte Cagnero 90–91
 Nankai Trough 193, 232, 236, 240, 241
 ODP Hole 647A **60**, 68–71
 ODP Hole 711A 106, 107
 Stirone section 310, 317, 318, 321
 Tibetan Plateau 163, 164, 166
 Umbria–Marche Basin 120, 124, 125
- sedimentation rate
 red beds 128
 rhythmites 363, **367**, 369, 370
- seismic line, NW Atlantic 31
- seismic moment tensor analyses 173
- sequence stratigraphy, Cupido Formation 333, 335, 337–338
- Serra Geral lavas 295, 297, 298, 302, 303
- shipboard palaeomagnetic measurements 197, 198, **200–223**, 232, 240
- shortening rate 168–169, 186
- siderite 343, 344, 378, 385
- SIRM *see* saturated isothermal remanent magnetization
- Skálamælifell Hill lavas 288, 290
- slip plate boundary 191–192
- soft ranges 167, 168, 169
- soft-sediment, susceptibility 282, 283–285, 287, 289
- solar cycle periodicity 365–367

- spectral analysis
 Cupido Formation, Mexico 333, 334, 337
 Guadalupian, Texas 380–381, 388–389
 Kope Formation, Kentucky 348
 ODP Hole 647A 38, 71–72
 palaeoclimate proxy 356, 357, 366, 370
 rhythmites, Brazil 355, 356, 360, 362, 363, 366–370
- spectral analysis, magnetostratigraphy 294, 296–303
 artefacts 306
- spline function 345, 380, 381, 382
- stability tests, magnetic 226–228, **231**
- stable isotopes, ODP Hole 647A 38, 72
- Stirone section, age model 317–320
- storm deposits 343
- Stratotype Canyon 376, 377, 382, 385–387, 389–392
- strike slip, Jiuquan Basin 186
- subduction zone 192, 193
- Sunan, magnetostratigraphy 154, 156, 158, 159, 160
 sedimentology 161–163
 tectonics 164, 166
- susceptibility and temperature 282, 285, 287
- synthetic data series 299–301
 real data comparison 303
- T3 Climate Event 389
- Tahiti reef sequence 288
- taxon **40–49**, 87–89, 105–106
- tectonics and palaeomagnetism 6, 8
- temperature (low-) and magnetics 329
- temporal resolution 309
- tephra 262
- Tethyan reference age model 124–125, 126–127
- Tethys Block 168
- Tethys Ocean 112, 152
 closure 81
- Texas (West) sections 376
- thermal demagnetization
 Cupido Formation, Mexico 330
 Guide Basin 137
 Jiuquan Basin, China 177, 178
 Monte Cagnero, Italy 83, 85, 86
 Nankai Trough 193, 195, 197, 198
 ODP Hole 647A 34, 35
 Stirone section 312, 314, 315
 Tibetan Plateau 156, 158
- thermomagnetic curve 225, 265
- thermomagnetic heating 85, 86–88
- thermomagnetic susceptibility measurement 379, 380, 386
- thermoremanent magnetization 3
- Tibetan Plateau (NE) 149–169
 geology 149–156
 magnetostratigraphy 158–161
 palaeocurrents 164
 palaeomagnetic direction **175–176**, **182–184**
 sampling and measurement 156–158
 sedimentology 161–163
 shortening 168–169
 uplift and tectonics 163–167, 173–174
- time calibration and spectral analysis 360
- time calibration to astronomical parameters 363
- time control, high resolution 309
- time, uneven sampling 293, 294, 296
- time-series analysis 380–382, **390**
 methods, magnetic cyclostratigraphy 330
 Middle Permian 387, 392
 Milankovitch cycle 313, 335, 342, **346**, 348
- titanomagnetite 228
- titanomaghemite 102, 105, 107, 197, 224, 228
 Pringle Falls 264, 275
- tree rings, Holocene 365
- U-channel methods 16–18, 282, 286, 288, 289
- Umbria–Marche Basin 111–128
 age-depth models 114, 122–127
 geology 112
 methods 112–114
 sections, integrated stratigraphy 115–128
- unconformity 73
 Middle Eocene *Fig. 10* opposite page 56
 Tibetan Plateau 156, 160, 161, 163, 166–167
- uplift, Jiuquan Basin 165, 186
- uplift, Tibetan Plateau 173–174
- U–Th dating 288
- U–Th/He dating 151
- variable field translation balance 282
- varvitos *see* rhythmite
- Verwey transition 224, 228, 329
- VGP *see* virtual geomagnetic pole paths
- virtual geomagnetic pole 4
 oscillatory trajectories 304
- virtual geomagnetic pole paths 269–274
 Brazilian lavas 293–306
 deep sea sediments 19, 21, 22, 24
 Guide Basin 137, 138, 140–141
 Jiuquan Basin 177, 181
 Pringle Falls 269–274
 Stirone section 311, 312, 313
 Tibetan Plateau 157, 158, 160, 161
- viscous remanent magnetization 3
- volcanic magnetostratigraphy 293–294
- volcanism, Tibetan Plateau 149, 151
- Wanda Swamp 245, 246, 254
- warming event 72, 73
- wavelength in virtual geomagnetic pole trajectories
 293–306
 dataset 294
 periodogram analysis 298–299
 phase determination 301–302
 spatial behaviour 303–304
 spectra stability 301
 study method 294–298
 testing and comparison 299–306
- Wenshushan, rotation study 174, 177, 180, 183, 185
- Wordian, global stratotype 376, 383–385, 387, 390, 392
- Yellow River, erosion 146
- Yumu Shan Fault (Northern) 150, 152, 154, 155, 166–167
- Yumu Shan
 magnetostratigraphy 150, 152–158, 160–161
 rotation study 174, 177, 180, 183, 185
 sedimentology 163
 tectonics 164, 165, 166