

Index

Page numbers in *italics* refer to Figures. Page numbers in **bold** refer to Tables.

- Allaqi-Heiani-Onib-Sol suture 290
Almāj Mountains 391, 399–400
Alps *see* Southalpine domain
amphibolite in crustal modelling 74, **74**
amphibolite–eclogite–granulite-facies transitions
 see Lindås Nappe
amphibolite-facies metamorphism 449
 see also greenschist-amphibolite facies
amphibolitization *see* Diego de Almagro Island study
anchizone, pyrite growth 141, 143
Anğara-Kan craton 90
Anjiacha Formation 267
Anzishan, granulite-facies metamorphism 458, 460
Arabian–Nubian Shield 287
 geological setting 288–289, 288, 294
 metamorphism 289
 structural setting
 Atalla 293–295
 Gidami 293
 Um Balad 290–291, 291
 Wadi Fatira 292–293, 291
 tectonic setting 289–290
gold mineralization studies 290, 292
methods of analysis 296
ore mineral assemblage 295–296, 295
results
 fluid inclusions 297, 300, 300, **301**, 302
 geochemistry 296–297, 297, **298**, **299**
 results discussed 302–303, 305, 306–307, 308,
 309–310
Argentina
 San Luis Formation **139**
 Sierra Valle Fertil Complex 66
Asia–Australia collision *see* Seram
Asia–India collision 146
Atalla gold deposits 293–295
Aukari gold mine 287
Australia–Asia collision 167
Balkan–Carpathian Variscan orogenic system 389, 390
 geological setting
 Alpine architecture 391
 Corbu metasediments 392
 phases of deformation 401
 basement
 Almāj Mountains 399–400
 Bulgarian Stara Planina 392, 394, 396–397
 Deli Jovan massif 398–399
 characterization methods 400–402
 metasediment petrostructure 402–403, 404, 405
 mineral chemistry **403**, 406–407, 408, **410**
 P–T evolution
 pseudosections 407, 409, 411, **412**, 413
 andalusite–muscovite–chlorite 414
 garnet nucleation 409
 garnet rims 409, 411, 414
 significance of results 414, 415, 416, 418–421
 summary 421–422
Baltica collision 198, 241
Bambui Group **139**
Banda Arc 168, 168, 169
Barberton Greenstone Belt
 geological setting 316–318, 317
 history of research 315–316
 metamorphic analysis
 description of samples 320
 methods 320, 322
 thermodynamic modelling 322–323
 results
 Hooggenoeg Formation 325–326, 325, 326
 Komati Formation 323–324
 Kromberg Formation 326–328, 327
 Mendon Formation 328
 Middle Marker Chert 324–325, 325
 results discussed 328–329, 330–331
 summary 331
 metamorphic constraints 318–320
 stratigraphy 319
barometer, GASP 30
Bergen Arcs 198, 241
 mineral compositions 202
 petrology 200
 see also Lindås Nappe
Bhutan 146, 147
 metapelite study *see* garnet *also* monazite
Bibong metabasite 456
biotite chemistry 406–407, **410**
Blanský les Massif **16**, 17
blueschist, Wudang complex 456–457
Bohemian Massif 13, 17
 anatectic melt inclusion (nanogranitoid)
 characterization 14–15
 constraints on partial melting 1517
 key localities 15, **16**
 major and trace element chemistry 20–21
 role of fluids and fluid inclusions 17–20
Gföhl Unit 66
granulite type locality 14
importance of ores 13
Orlica–Śnieżnik Dome
 constraints on melting 24–29
 significance of experimental petrology 29–32
Bonavista Formation **139**
Brazil **139**
Brixen Granite 119
Bulgaria *see* Western Stara Planina
calcium, enrichment in garnet 89, 90
 see also zoning in garnet
Caledonian Orogeny 198, 241
Canadian Cordillera *see* Frenchman Cap Dome
Carpathians, Alpine architecture 391
Changba–Ljjiagou Pb–Zn deposit 265
 fluid inclusion study
 methods of analysis 269
 results
 isotopes 275

- Changba–Lijiagou Pb–Zn deposit (*Continued*)
 microthermometry 270–273
 petrography 269–270
 Raman spectroscopy 273
 results discussed 275–281
 summary 281
 geological setting 267, 268
 mineralization 267–268
 stratigraphy 269
- Changbazi zone 460
- Chile *see* Diego de Almagro Island
- China *see*
 Changba–Lijiagou Pb–Zn deposit
 Jixian HP granulite
 Qinling–Sulu–Odesan collision belt
- chlorite chemistry 407, **410**
- collision tectonics 449
see also Jixian *also* Qinling–Sulu–Odesan collision belt
- contact metamorphism, experimental study
see Southalpine domain
- continental collision belts 449
- continental crust, differentiation 13
- continental slab subduction 449
- Corbu metasediments of Balkans
 P–T–D study 392, 402–403, 407–414, 414–415
- cristobalite 15
- crustal differentiation 65
- crustal melting *see* Bohemian Massif nanogranitoids
- crustal modelling *see* STyx
- Dachschiefer Formation **139**
- Dabie Mountains 266
- Dabie unit 452, 454
- Dabie–Hongseong–Odesan collision belt 450
- Dalsfjord 199, 199
 mineral compositions 202–207
 petrology 201–202
- Deli Jovan Massif 391, 398–399
- Deokjeongri granite gneiss 456
- devolatilization, facies transition *see* Arabian–Nubian Shield
- diamond, Bohemian Massif 14
- Diego de Almagro Island 218–220, 219
 exhumation study
 metamorphic stages 219–220
 methods of analysis 220–224
 results
 petrology 224–227
 pseudosection modelling 227, 231
 results discussed 231, 233–235
 summary 235–236
- differential element mobility *see* Yenisey Ridge
- differentiation 65
- dynamic fractional crystallization modelling
 76–80
- East Gondwana collision 289
- Eastern Europe *see* Bulgaria; Romania; Serbia
- Eastern Hebei terrane *see* Jixian
- eclogite, Nordfjord 198
- eclogite–amphibolite–granulite-facies transitions
see Lindås Nappe
- eclogite-facies and amphibolitization *see* Diego de Almagro Island
- eclogites
 HP in China 453–456
 UHP in China 451–453
see also symplectites *also* kelyphites
- Ecuador, El Oro Complex 66
- Egypt *see* Arabian–Nubian Shield
- El Oro Complex 66
- electron probe micro-analyser (EPMA) 39
 history of development 40
 quantitative compositional mapping 41
 advanced standardization software 51
 corrections 51–52, 54
 internal standardization 54–55, 57
 mass concentration images 57
 multi-channel classification 51
 applied to rock-forming processes 41
 modal abundances 41–43
 petrochronology 45
 thermobarometry 43–45
 data reporting standards 57–59
 empirical correction 47
 first approximation 46–47
 internal standardization 48
 procedure 50–51
 resolution issues 48–50
 standardization techniques 45–46
 ZAF matrix correction 47–48
 summary of future directions in quantitative compositional mapping 59
- energy-dispersive spectrometers (EDS) 39
- epidote–amphibolite facies 449
 Wudang complex 456–457
- epizone, pyrite growth 141, 143
- Erlangping back-arc basin 450
- Erlangping Group 266
- Erzgebirge 15, **16**, 198
- Everest, Mount 335
 metamorphic evolution of STDS in Rongbuk Valley
 history of study 336–339
 mapping and recognition 339–340, 341, 342
 methods of analysis
 L.R. Wager sample collection 339
 microstructural petrology 342
 mineral P–T indicators 353, 355
- results
 fabric evolution in semipelites and calcareous rocks
 brittle fractures 347
 equilibrated microstructures 342–343
 microfolding 345–346
 prograde microstructures 343–344
 shear band cleavage 346–347
 shear fabrics 344–345
 granite sheet microstructures 347–348
 deformation regimes quantitative petrography 348–349, **350**, **351**, **352**, 353
 P–T constraints 353–357
 results discussed 357–367
 summary 367–369
- exhumation
 amphibolitization *see* Diego de Almagro Island
 eclogite *see* symplectite
- experimental metamorphic petrology (forward modelling)
 29–32, 117–118
see also Southalpine domain

- facies transitions *see* Lindås Nappe
felsic magma segregation 66
Fiordland, New Zealand 66
fluid inclusion studies 5, 7, 17–20
see Arabian–Nubian Shield *also* Changba–Lijiagou
Pb–Zn deposit
flying-spot X-ray method 40
forward modelling *see* experimental petrology *also*
pseudosection modelling
framboids *see under* pyrite
Frenchman Cap Dome (Canada) 374–375, 374
geological setting 374, 375–376
isograd study
classification
prograde 379
retrograde 379–381
structural 381–383
discussion 383–385
summary 385–386
metamorphic zones 376–377, 378
- Garevka Complex 90
metapelite study *see* Yenisey Ridge
garnet 40, 89, 217–218
Corbu metasediment, chemistry 403, 406, **406**, **407**,
409, 411, 414
calcium and zoning in multistage metamorphism
see zoning in garnet
Diego de Almagro Island 218–220, 219
exhumation and zoning study
metamorphic stages 219–220
methods of analysis 220–224
results
petrology 224–227
pseudosection modelling 227, 231
results discussed 231, 233–235
summary 235–236
rare earth element study in Bhutan metapelite 145–146
methods of analysis 146–147
results
geochronology 157–158
petrography and mineral chemistry **148**, **149**,
150–152, 152, 153, 155–157
thermobarometry 157
results discussed 158–159, 160, 161, 163
summary 164
Seram granulite 174–175, 175, 176, 178, 179, 180,
183–185, 185–186, 188–189, 190, 191
- Garnet–aluminosilicate–plagioclase (GASP) barometer 30
Geluk Subgroup 316, 318
geobarometers, calibration 89
geochemistry 2–3
Jixian granulite 431–432, **433**, 434, **435**, **436**,
437, 437
see also Arabian–Nubian Shield gold *also* Seram
geochronology 3–4
garnet 174–175, 175, 176, 178, 179, 180, 183–185
monazite 150, 157–158, 176
zircon U–Pb 175, 437–438
geochronometers, monazite 145, 176, 188
geothermobarometry (inverse modelling) 117
role of experimental work 133
Germany **139**
Gföhl Unit 66
Gidam gold deposits 293
gold *see* Arabian–Nubian Shield
Gondwana Supercontinent 289–290
granulite 14
HP *see* Jixian
UHT 449, 457–460
see also Seram
granulite-facies metamorphism, Korean Peninsula 457–460
granulite–eclogite–amphibolite-facies transitions
see Lindås Nappe
Granulitgebirge 15, **16**
Greater Himalayan Sequence 146, 335
Greenschist–amphibolite-facies transition
see Arabian–Nubian Shield
greenstone *see* Barberton Greenstone Belt
- Hamed–Yanbu suture 290
Himalaya
Asia–India collision 146
collision belt metamorphism 450
see also Everest
Holsnøy Island 199, 199, 200, 241, 242, 243–244
see also Lindås Nappe
Hong’an unit 452–453, 454
Hong’an–Dabie–Sulu collision zone, UHP eclogites
451–453
Hongseong–Yangpyeong–Odesan belt 450, 467
Hoogenoeg Formation 318, 319
metamorphic interpretation 325–326
Hordfjord–Sognfjord Detachment Zone 198
HP eclogites, Qinling–Sulu–Odesan belt
453–456
HP and UHP metamorphism 449
see also Jixian
Husebvatnet *see* Lindås Nappe
Hutton, James 14
hydration and stress 7
see also Lindås nappe
hydrothermal activity, microphyrite 138
- illite crystallinity 139
India–Asia collision 146
Indonesia *see* Seram
isochemical phase diagrams *see* pseudosections
isograds 373
Canadian study *see* Frenchman Cap Dome
inverse modelling 117
- Jiantasi–Ziali–Baiyuni zone 760
Jiao–Liao–Ji Belt 427, 429
Judianya zone 460
Jixian HP granulite study
methods
bulk rock geochemistry 434, 437
mineral chemistry 431–432, 434
petrography 429, 431
thermobarometry 438–439
zircon U–Pb geochronology 437–438
results 439–440, 442, 443–444
summary 444
- Kaapvaal Craton 317
Kakthang Thrust 146
kelyphite 197, 198
see also Western Gneiss Region
Kerf suture 290

- Kerala Khondalite Belt 29
 Khondalite Belt 427, 429
 kimdykolite 15
 Klausen Diorite 119
 Kobipoto migmatite complex 167, **172**
 tectonic setting 170–171, 173
 kokchetavite 15
 Komati Fault 317, 318
 Komati Formation 317, 318, 319, 319
 metamorphic interpretation 323–324
 Korean Peninsula 450, 453–456, 467
 granulite facies metamorphism 457–460
 post-collisional igneous activity 460–464
 Kromberg Formation 318, 319
 metamorphic interpretation 326–328
 Kuanping Group 266
 Kübler Index (KI) 139
 Kunlun Mountains 266
- Laurentia collision 198, 241
 Laya Thrust 146
 lead *see* Changba–Lijiagou Pb–Zn deposit
 Lesser Himalayan Sequence 146
 Lhotse Detachment 336
 Lindås nappe 198, 241, 242, 243
 facies transition, hydration and stress
 methods of analysis 243, 244
 results
 bulk rock composition 244, 245, **246**
 mass transfer 251–254
 model of phase equilibria 254–256, 256, 257
 petrography
 metamorphic reactions 247–248, 251
 mineral composition 244–245, 247, 247, **248**,
 249, **250**, **251**
 texture 244, 247
 results discussed 257–260
 Lu–Hf ages 183–184, 185, **186**, 188–189, 190
- Madurai Block 450
 magma segregation and ascent 66
 modelling methods
 mathematical formulation 68–69
 petrological calculations 69, 71–72
 see also STyx
 Main Central Thrust 146, 335
 mantle-derived magmas 65
 MASH zone 65–67
 mass transfer analysis *see* Lindås Nappe *also* Yenisey
 Ridge
 melt connectivity 66
 melt flow modelling *see* STyx
 melt inclusions (nanogranitoids) 4, 14
 see Bohemian Massif study
 melt segregation and extraction 67–68, 68
 see also STyx
 Mendon Formation 318, 319
 metamorphic interpretation 328
 metallogenesis *see* Qinling
 metamorphic geology, role of
 fluids and ores 5, 7
 future studies 6, 7–8
 geochemistry 2–3
 low grades 4–5
 melt inclusions 4
 petrochronology 3–4
 physical and chemical modelling 4
 scale questions 5–6
 thermobarometry 1–2
 metamorphism
 HP/UHP and UHT 449
 impact on micropyrite 141, 143
 impact on REE distribution 146
 methods of study 117
 role of experiments 117–118
 metapelites
 mass transfer study *see* Yenisey Ridge
 monazite geochronometer *see* monazite
 Mianlue suture zone 266
 Mianlue tectonic belt 458
 micropyrite *see* pyrite
 Mid-German Crystalline Ridge 198
 Middle Marker Chert 318, 324–325
 mineralization *see* Arabian–Nubian Shield gold *also*
 Changba–Lijiagou Pb–Zn deposit
 Miocene *see* Seram granulite study
 modelling 4
 experimental 117
 forward *see* pseudosection modelling
 inverse 117
 magma ascent *see* Styx
 thermodynamic *see* Barberton Greenstone Belt
 Moldanubian zone 15, **16**
 Monashee Complex *see* Frenchman Cap Dome
 monazite
 in Bhutan metapelite
 as geochronometer 145, 176, 188
 rare earth elements 145–146
 REE study
 methods of analysis
 geochronology 150
 major elements 146–147
 thermobarometry 150
 trace elements 147–150
 results
 geochronology 157–158
 petrography and mineral chemistry **148**, **149**,
 150–152, 152, 153, 154, 155–157
 thermobarometry 157
 results discussed 159–160, 161, 163
 summary 164
 in Seram granulite 173, 174, 176, 188
 Mozambican Ocean 289–290
- Nabitah suture 290
 Najd Fault System 287, 290, 309–310
 Nakasib–Bir Umq suture 290
 nanogranitoids (melt inclusions) 4, 14
 see Bohemian Massif study
 Nepal 335, 336
 Neptunist v. Plutonist theories 14
 New Zealand, Fiordland 66
 Nizhneangara Fault 90, 91
 Nordfjord 198, 199
 mineral compositions 202
 petrology 200–201
 North China Craton and Block 266, 428, 429, 450, 451
 collision tectonics *see* Qinling–Sulu–Odesan
 collision belt
 granulite study *see* Jixian

- North Col Formation 336
 North Korea–China Craton 467, 468, 469
 North Qinling tectonic unit 266
 Northern Laioning–Southern Jilin terrane 429
 Norway *see* Bergen Arcs *also* Western Gneiss Region
- oceanic slab subduction 449
- Odesa
 granulite-facies metamorphism 458
 Triassic igneous activity 460–464
- Odesan Gneiss Complex 458
- omphacite 197
- Onverwacht Group 316, 317, 318, 319
- ore minerals, significance of 5, 13–14
see also Arabian–Nubian Shield *also* Changba–Lijiagou
- Orlica–Śnieżnik Dome *see under* Bohemian Massif
- oxygen isotope analysis, Barberton Greenstone Belt 322
- Pan-African Orogeny 289, 290
- partial melting 65
 evidence from nanogranitoids *see* Bohemian Massif
 model 75–76
 significance of 13, 14
 thermodynamic modelling 118
- Pb–Zn deposit *see* Changba–Lijiagou Pb–Zn deposit
- percolation threshold 66
- Permian contact metamorphism *see* Southalpine domain
- Pizarras de Luarca Formation **139**
- plagioclase chemistry 406
- Plešovice Quarry **16**, 17
- pluton formation 65–66
- Plutonist v. Neptunist theories 14
- Polish Sudetes **15**, **16**
- Predivinsk terrane 90
- pseudosection modelling (forward modelling) 117
 Egyptian gold deposition 303, 304, 307, 309
 Everest, Mount, L.R. Wager samples 353–357
see also Balkan–Carpathian orogenic system *also*
 Southalpine domain
- pyrite
 crystals 137
 framboids 137, 138
 metamorphic 138
 hydrothermal processes 138
 palaeo-redox conditions 137–138
 study in roofing slates
 methods of analysis 139–140
 results 140–141, 141, **141**, 142
 results discussed 141, 143
 samples 139, **139**
- pyrrhotite 138
- Qinjiagou–Zhangjiagou zone 460
- Qinling Group 266
- Qinling Pb–Zn metallogenic belt 265, 266
see Changba–Lijiagou deposit
- Qinling–Dabie–Hongseong collision belt 467–469
- Qinling–Dabie–Sulu collision belt 450
- Qinling–Sulu–Odesan collision belt 450
 evolution in Permo-Triassic 450–451
 granulite-facies metamorphism 457–460
 HP eclogites 453–456
 P–T–t paths 453
 patterns along the belt
 igneous 465–466
 metamorphic 465
- post-collision igneous activity 460–465
 tectonic model 463
 tectonic models, previous research 466–467
 tectonic models recent 467–470
 UHP eclogites 451–453
 Wudang complex 456–457
- Qomolangma Detachment 336, 340
- Qomolangma Formation 337
- quartzphyllites, experimental contact metamorphism *see*
 Southalpine domain
- rare earth elements (REE) in minerals 145–146
see under monazite *also* garnet *also* zircon
- Rayleigh fractionation 146
- reactive melt flow modelling 80–83
- REE *see* rare earth elements
- rehydration, eclogite and amphibolization
see Diego de Amagro
- retrograde metamorphism 449–450
- Rodinia Supercontinent 289–290
- Romania *see* Almáj Mountains
- Rongbuk Valley *see under* Everest
- roofing slates *see* slates
- rutile 173, 174
 Zr in rutile thermometry 181–183
- Sandspruit Formation 316, 317, 319
- Santa Maria Beds **139**
- Saxo-Thuringen Zone **15**, **16**
- scanning electron microscopes (SEM) 39
- SEDEX Pb–Zn mineral systems 265
- Selkirk Allochthon 375
- Seram 168, 168, 169
 tectonic and metamorphic setting 170–171, 173
- UHT granulite study
 methods of analysis 181–182
 geochemistry 176, 178
 geochronology 175, 176, 183–184
 petrography 173
 results
 geochemistry 178–181
 geochronology 175–176, 184–185
 petrography 173, 174–175
 thermometry 182–183
 results discussed 185–189, 191
 summary 191–192
- Serbia *see* Deli Jovan Massif *also* Western Stara Planina
- Shangdan suture zone 266
- SHRIMP *see* monazite *also* zircon geochronology
- Siberia *see* Yenisy Ridge
- Sierra Valle Fertil Complex 66
- slab break-off 449, 470
- slates, pyrite study *see* pyrite
- Sm–Nd ages 184, 185, **186**
- South Africa *see* Barberton Greenstone Belt
- South China Craton and Block 450, 451
 collision tectonics *see* Qinling–Sulu–Odesan
 collision belt
- South Korea–China Craton 467, 468, 469
- South Qinling tectonic unit 266
- South Tibetan Detachment System (STDS) *see under*
 Everest
- Southalpine domain 118
 Permian contact metamorphism 119–120
 methods of analysis 120

- Southalpine domain (*Continued*)
 experimental simulation 120–121
 results
 Franzenfeste aureole 120, 121, **122**, 123–125,
 123, 124, 125, 126
 Klausen aureole 120, **122**, 125–126, 127, 128,
 128, **129**
 pseudosection calculations 128–129, 128, 130, 131
 results discussed 131–133
 summary 133–134
- Spain **139**
- Stak eclogite 198
- staurolite chemistry 406, **406**, **407**
- STyx (storage, transfer, and hybridization
 of complex liquid)
 methodology 68–69
 model set-up 73–75
 modelling approach 72–73
 petrological calculations 69, 71–72
 results
 dynamic fractional crystallization 76–80
 partial melting 75–76
 reactive melt flow 80–83
 results discussed 83–84
- Sula Spur 169
- Sulu unit 451–452, 452
- symplectites 197–198
see Western Gneiss Region
- Tan-Lu fault 451
- Tehoru Formation 171
- Tethyan Himalayan Sequence 146
- Teya Complex 90
- Theespruit Formation 316, 317, 319
- thermobarometry 1–2
 garnet–monazite 159–160
 Jixian granulite 438–439
 symplectites 197–198
 use of EPMA 43–45
- thermodynamic modelling *see* Barberton Greenstone Belt
- thermometry 181–183
- Tibet 335, 336
- Tjakstad Subgroup 316
- Tongbai unit 454–455, 455
- trace element analysis 40
- Trans-North China Orogen 427, 429
- U–Pb geochronology *see* monazite *also* zircon
- UHP eclogites, Qinling–Sulu–Odesan belt 451–453
- UHP metamorphism 449
- UHT granulites and metamorphism 449, 457–460
see also Seram
- Um Balad gold deposits, structural setting 290–291
- Vardar Ocean 391
- Variscan Orogeny 13
see also Balkan–Carpathian Variscan orogenic system
also Bohemian Massif
- volcanogenic massive sulphide systems 265
- Wadi Fatira gold deposits 292–293
- Wager, L.R. 335
see under Everest
- wavelength-dispersive spectrometers (WDS) 39
- Werner, Abraham Gottlob 14
- West Gondwana collision 289
- West Qinling Orogen 265, 267
see also Changba–Lijiagou Pb–Zn deposit
- Western Gneiss Region (Norway) 198, 199
 symplectite and kelyphite studies
 methods of analysis 200
 results
 mineral compositions 202–207
 petrology 200–202
 results discussed 207–214
 summary 214
- Western Laioning terrane 429
- Western Stara Planina 391
 structures 392, 394, 396–397
- white mica chemistry 407, **410**
- Winklarn Quarry **16**, 17
- Wolhyunri Formation 456
- Wudang complex 456–457
- Wujiashan Formation 267
- X-ray maps 39
 computer software tools 40–41
 flying spot method 40
- X-ray tomography, high resolution
 micropyrrite study 139
 experimental set-up 140
- Xicheng ore cluster *see* Qinling
- Xujiaping zone 460
- Yangtze Craton and Block 266
- Yaogou zone 460
- Yenisey Ridge 90, 91
 Garevka Complex metapelite study 92
 description
 geochemistry 92–93
 mineral chemistry 93, **94**, **95**, 96
 trace element distribution 102–103
 petrography 90–92
 tectonomorphic evolution 99, 102
 modelling metamorphic conditions 96, **97**, 98–99,
 103–105, **106**, **107**, **108**, 109–111
 summary 111
- Zhujiage zone 460
- zinc *see* Changba–Lijiagou Pb–Zn deposit
- zircon, Seram granulites 173, 174, 176, 177, 178–180,
 180, 181
 U–Pb geochronology 175, 437–438
- zoning in garnet 40
 Garevka Complex metapelite study 92
 description
 geochemistry 92–93
 mineral chemistry 93, **94**, **95**, 96
 trace element distribution 102–103
 petrography 90–92
 tectonomorphic evolution 99, 102
 modelling metamorphic conditions 96,
 97, 98–99, 103–105, **106**, **107**, **108**,
 109–111
 summary 111
- Zr-in-rutile thermometry 181–183