Index

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

Acadian Orogeny 45–46
accretion 112
  Grampian Terrane 62–64
  seismic reflection 76
  Southern Uplands 71–73, *74*
accretionary event, Late Ordovician 80
Agdenes detachment 246, *253,* 257, *258,* 261–263
Agder phase 216
Agder Terrane *196*
  correlation 213
albite porphyroblast schist 472, *474*
Allochthonous Basement 405
allochthonous fold and thrust belt 13–16, 20
  oceanic affinity 17–18, 21–22
allochthonous terranes 438
allochthonous unit 225
allochthons, Caledonian 3, 160–161, 321
Alps (western), cross-section *502*
Altevann, detrital zircon 162–164, 167, *168*
Alum Shale 160, 246, 255, 258, 294, 301, 311, 340
Amazonia 29
Amerasian basin *94,* 111
Åmotsdal Quartzite 246, *255, 256, 261,* 265
amphibole *388*
  electron microprobe analyses **379, 391, 456,** 459
amphibolite 358
  titanite/zircon analysis 209
amphibolite facies 343
  geochronology 249–251
  regression 460–461
anatexis 195, 198, 237, 627
Andean-type subduction 46, 502, 504
andesitic source magma 184, 188, 189
Annagh Gneiss Complex 54–56
annite 449, *450,* 451, 461
anorthosite 198, 200, 215, *226,* **229,** 230, 231, 236
  geochemistry *590*
anorthosite, mangerite, charnockite, granite suite 445, 448
apatite 429
apatite fission track
  age 683, 688–691
  data **684–685**
Ar/Ar age 4, 106, 107, 244, 356, 358, 387
  Grampian 54, 60
  Lofoten islands **446,** 447–448, 459–463
  Tjeliken eclogite 371
Ar/Ar analyses 451, 455
  method 339–340
Ar/Ar data 193
Ar/Ar step-heating spectra *452–454,* 457, 460
arc accretion, Greenland 112
arc volcanism, Ordovician 67
arc–continent collision
  timing 73–76
Archaean Domain
  age and geology 158–159
Arctic Alaska terrane 108, *108,* 110
Arctic Caledonides 93–119
  phengite eclogites 386–399
  remnants 109–112
Arctida 161, 166–167
Åre area 340, 343
  geophysical data 303, 305
  proposed drill site 316
  sample location 323, *323*
Åreskutan Nappe, amphibolite–granulite 355–362
  basal thrust *342*
  metamorphism, timing 356–357
  metamorphism, ultra high temperature 321–334
  schematic section *348*
  SIMS U–Pb zircon geochronology 343–344
Argyll Group
  volcanism 77, 78
ash beds, geochemistry 177–190
Atlantic Ocean
  Caledonian orogens *94, 635*
  opening 243
augen gneiss 225–227, 230, 231, 235, *252,* 253, 255
  concordia diagram *234*
Autochthon 133–136, 140, 148, 272, 438
  age *437*
  Finnmark Caledonides 296
autochthonous basement 13–15, 20, 24, 316
Avalonia
  collision 11, 29, 30
  collision, Laurentia *46,* 75–76
  palaeogeography *12*

baddeleyite 404, 407–418
balanced cross-section
  restoration 285–287
Ballantrae Igneous Complex 64–66, 70, *71*
Ballantrae Ophiolite 496–497
Ballybofey Nappe 475
Baltica
  accretion 166–167
  geochemistry, bentonites 177–190
  passive margin 161
  plate boundaries *158*

Baltica (*Continued*)
rotation 150
underthrust 157
Baltica–Laurentia 59, 64, 66, *74*
Baltica, collision *46,* 75–76, 243, 382
Avalonia 11, 29, 30
Bamble-Kongsberg Terrane 195
Barents Sea succession 28, *274*
Barents Shelf *94,* 111
Barentsia block 167
Barrovian zones 58, 75, 79, 472, *474,* 477, 563
basement *214*
allochthonous 16, 17–18
autochthonous 13–16, 20
Baltica 246
basement culminations 23
basement imbrication *259,* 261
basement, Precambrian 195–203
bastnesite 428
batholith 603, 604
bead zircon 414–416, 421
zirconium sources 418–419
bedding, stereoplot *283*
bentonite 136, 187–189
geochemistry 177–179, *180,* **182–183,** 184
Bergsdalen nappes 199
Betusordda Antiformal Stack 279
Bindal Batholith 603, 604
biotite 343, *344,* 358
Åreskutan Nappe 333
biotite composition 179, 184, *187, 188,* 189
microprobe analysis 326, *327,* **329,** 330
whole-rock data **182–183**
Biscayarhalvøya
eclogites 399
geology 385, 387
Bjørnøya *108*
tectonic history 109
unconformity 114
black phyllite 244, 258
black schist 246, 255, 264
Helgeland 594, 595, 597
black shale 16, 17, 21, 160, 245, 305
Åreskutan Nappe 334, 340, 360, 363
Scandes 133, 135, 136, 139
Scotland/Ireland 60, 62–64
Southern Uplands 72
blueschist 107, 109, 398, 497, 505
Scotland–Ireland 59, 64, 66, *74*
Boknfjorden Nappe 202
Bolvær Complex 585–599
Børsely Duplex 279
boudin **446,** *449,* 451, 455
eclogite 247, *248,* 249
Bouguer gravity anomaly 307–309, 312, 314
Boundary Slide 472, *499*
Bratten–Landegode gneiss complex 633–650
geochronology 639–645
geology 634–639
provenance 646–648
tectonic setting 645–646, 649
Bratten–Landegode granite 640–641
breccia 229–230
brittle deformation, dating 697
Buchan zones 58, 59, 472, *474,* 477
buoyancy 243, 361, 362, 427, 443
burial 18, 243

calc-alkaline composition 189, 361
Timanian 161
Tjeliken eclogite 371
calc-alkaline granites *188*
calc-alkaline magmatism 112, 186
calc-silicate psammite, zircon signature 144, 147
Caledonian deformation front 111
Caledonian nappes 197–203, *437*
provenance 212–213
Caledonian orogenic cycle 45, *46*
Caledonian orogeny
Devonian–Carboniferous metamorphism 117–118
duration and timing 360
Ordovician metamorphism 115, *116*
Ordovician–Silurian arc magmatism 115–117
carbonate 114, 636
carbonatite magma/volcanism 186, 190
cathodoluminescence 211
zircon images *345, 433*
Central Caledonian Transect 301
chalcopyrite 230
channel flow 263
charnockite 225–226, *228,* 230, 231, 236, 461
chevron folds 284
chitinozoan 475
chlorite pseudomorph 486, *487*
Cl in fluids 459, 460
cleavage 72, 76, 471, 478, 479, 489
crenulation 75
stereoplot *283*
Clew Bay Complex 63, 67, *74*
clinopyroxene *388,* 392–397, 429
microprobe analyses **377, 390, 391**
clinozoisite 390
cobbles, meta-igneous 588–589, *590,* 593–595, 597
coesite 249, 264, 332–333, 369, 380, 429
relict 326
collision
age 30, 118
Avalonia, Baltica, Laurentia 75–76
Baltica 372
Baltica–Laurentia 259, 404
age 372, 421, 428, 462, 579
Åreskutan 337–338, 361–363

Arctic area 115
eclogite facies 398–399
continental 214
Gothian/Telemarkian 237
Himalayan 1, 29
Scandian 243, 334, 603–604
collision, hard 67, 76
collision, soft 46, 76
Collisional Orogeny in the Scandinavian Caledonides *see* COSC
Colonsay Group 57
conglomerate *681, 682*
deformed *228,* 256, *264,* 679, 696–697
contact, intrusive 611
continental affinity 22–23
continental drift 29
cooling age 64, 66, 438, 578
Arctic areas 100, 107, 387
Lofoten 462–463
Seve Nappe 340
cooling curve, eclogite 448
cooling history 683–699
cooling rate 361, 362
copper mineralization 229–230
cordierite stability 612–613, **615**
Cordilleran terranes *94, 108,* 110–111
corona 436, 438
garnet 382, 388
metagabbro *410, 412*
rutile *392*
texture 429
titanomagnetite *411*
zircon 434
correlation, nappes (S Norway) 193
COSC-1 drill hole 301–317
(Collisional Orogeny in the Scandinavian Caledonides)
Cretaceous peneplanation 698
cross-section
Leirpollen Butressing Zone *280*
Morar Group *53*
Scandinavian Caledonides *25*
crust formation 436
crust, thickness 309
crustal anatexis 189, 603–628
crustal evolution 150, *437*
Sveconorwegian terranes 196
crustal imbrication 246, 257
crustal thickening 193, 213, 214, 438, 627
Arctic areas 117, 119
Grampian 504
crustal thinning, Permo-Triassic 697
crystalline basement 258, 301, 404, 634
density 307
seismic data 309
crystalline nappe *196,* 197, 198
crystalline rocks 223, *227,* 244
Cu–Zn deposits 22
dacitic, source magma 184, 187–189
Dala sandstone, zircon signature 140
Dalradian Supergroup 54, 57–59, 468–469, 488–489
geochronology 77, 475–478
volcanic activity 78–79
Dalsfjord Nappe 198, 213
décollement 259, 309
COSC drilling target 303, 305
Deer Park Complex 66
ophiolites 73
deformation
Espedalen Complex 230
Finnmark Caledonides 277–285
Grampian 72–75, 478–480
Vega complex 605, 608
deformation and magmatism
Greenland 113–114
deformation and metamorphism 72–75
geochronology 77
deformation, polyphase 11, 52, 57–58, 100
Grampian 467, 469, 472, 489, 505
dehydration 438
CO_2 425
slab 459
dehydration melting 333, 356
delamination 213
density 311, 314, 316
data **306**
depleted mantle 597, 599
depositional age, Dividal Group *164*
depositional environment 636
Helgeland Nappe 585, 597–599
detrital zircon age 3, *596,* 599
Uppermost Allochthon 634, 636, 646–648
detrital zircon study, central Scandes 131–151
allochthon 136–139, 140, 144–147, 149
analytical methods 139
autochthon 133–136, 140, 148–149
concordia plot *142, 143, 146, 147, 163*
discussion 149–151
detrital zircon study, Dividal Group 157–170
analytical methods 162
geological setting 158–161
results 162–165
samples 158
Devonian (Early), thrust and extension 241–265
exhumation 257–263
extensional detachment 251–253, 257
fabric evolution 246–249
geochronology 249–251
imbrication 257–263
out-of-sequence thrust 253–257
time sequence, problems 263–264
Devonian basins 244
Devonian detachment 18–19
Devonian, post-orogenic 679, 696–697

Devonian, timescale *250*
diamictite 103, 107, 110, 281–282
  Connemara 473
  Neoproterozoic 97
diamond 17, 18, 249, 369, 428
diatexite 609–613
digital elevation model
  COSC drill site *312*
diorite, Landegode 645
Dividal Group, detrital zircon study 157–170
dolerite, seismic reflection 309
dolomite 24, 109, 395
dolostone 273, 275, 295
Downbend Antiform 472, 483, 489, 501
drill site, COSC 3
  3D modelling 301–317
  geology 303–305
ductile fabric evolution 246–249
ductile strain 251, *252*
dyke
  age 200
  dolerite 114
  felsic 212
  granite 611
  mafic 30, **229,** 230
  titanite/zircon analysis 209–211
  Vega 608–609
dyke swarm 160, 428
  density 305
  dolerite/Särv nappes *132,* **134,** 138
Dyrskard Nappe 202, *214,* 216, 526, *527*
  titanite age 212, 215

Easdale Supergroup, volcanism 78–79
East Greenland Caledonides 646–648, 672
  correlation 649, 650
eclogite 17, *19,* 20–21, 30, 107
  Greenland 99, 115, 117, 118
  petrography 409
  phengite-bearing 385–399
  replacement 262
eclogite facies 264, 338, 358
  age 30–31, 200, 215, 249–251, 339, 420–421
  classified 385
  metamorphism and regression 4
  peak 256
  shear zone 443–463
Ede Quartzite 144, 149
eduction 18
Eikefjord Nappe 198–199
electron microprobe analyses 455
  Lofoten eclogites **456,** 459
epidote, Rb/Sr data **458**
erosion 18, 697, 698, 699
  rate 680
Espedalen Complex
  correlation 237
  interpretation 235–238
  major elements **229**
  sedimentary cover 230
  structure 230–231
  tectonostratigraphy 225–231
  U–Pb geochronology 231–235
Espedalen Nappe 198, *214,* 216
Eurasian Basin, closure 111
evaporites, meta- 339
exhumation 18, 31, 193, 215
  Åreskutan Nappe 332, 334, 356, 361, *362*
  fission track study 680
  Lofoten islands 443, 447–448, 462
  modelling 393
  Permo-Mesozoic 463, 683, 697, 698
  rate 249, 696
  Richarddalen Complex 387, 389, 398, 399
  Svalbard 101
  Tjeliken eclogite 382
  ultra- and high pressure rocks 241–265
  Western Gneiss Region 358, 428
exsolution, garnet 380, 420
exotic terrane 30, 103, 166, 197, 543
  Arctic Ocean 158, 160
  Baltica collision 362
  Bratten-Landegode 648, 650
  Ofoten-Troms 655–673
extension 10, 11
  age 461–462
  and exhumation 248
  Greenland 112
  Lofoten islands 448
  mélange 16
  Norway, southern 213
  post-collision 31, 118
extensional detachment 251–253, 257–263
extensional fault system, Early Devonian
    241–265

fabric evolution, ductile 246–249
faulting 698
  Mesozoic 680–682, 697
  post-Caledonian 682
fauna, chitinozoan 62–64
faunal affinity 360
feldspar
  mineral chemistry **568**
felsic dyke **446,** *449,* 462–463
felsic magma 619–622, 624
felsic pegmatite 447, 461, 462
felsic segregations **352–353,** 354–355, 362
Fennoscandian basement 31
Fennoscandian provenance 165–169
Fennoscandian Shield 11, 158–160
Finnmark Caledonides
  branch lines 285–287
  displacement and shortening 291–293

restoration 287–291
sediment depositional areas 293–296
structural data 277–285
tectonostratigraphy *274*
Finnmark Caledonides, lithostratigraphy 271–278
Autochthon 272
Komagfjord Antiformal Stack 277
Kunes Nappe 278
Laksefjord Nappe 278
North Varanger Terrane 275–276
Parautochthon 272–273
Rybachi-Sredni 276–277
Window Allochthon 273–275
Finnmarkian orogeny/event 29–30, 340
Finse Nappe 199, *200, 201,* 213
titanite age 212
U–Pb data 203, **204–205,** *208,* 209
Fiskå, granulite facies 425
fission track analyses, SW Norway 679–699
samples and methods 682–683, **687**
thermochronology 683, 688–696
flasergneiss *228*
Flatraket Complex *427,* 428–429
1100 Ma event 438, 439
granulites *437*
Pb/U concordia diagram *432*
U–Pb data **430–431,** 433–434
fluid inclusions
garnet 459
granulite 438
fluid infiltration, eclogite facies 443–463
analytical methods 455
mineral chemistry 455–457
fluids 10, 31, 202, 212, 495
folds, rotated 246
foliated eclogite
petrography 409–410
foliation 569, 571, 578, 579
Åreskutan Nappe 342, 343
Lofoten *450,* 455, 459, 462
Seve Nappe 325, *326*
Föllinge Graywacke 140, 144
Föllinge turbidites, zircon signature 149
forearc basin 67–70
foreland, Caledonian 100
Fuda schistose psammite, zircon signature 144

gabbro 397, 448, *450,* 672
Kråkeneset Complex *435,* 436
petrography 409
gabbro/eclogite transition, Trollheimen 403–421
gabbronorite 227, *228,* 229, 230
Gaissa Promontory 295–296
Gaissa Thrust Belt 278, 279, *280*
garnet 343, 379, 380, 385, 429
Åreskutan Nappe 332, 333
chemical profile *374*
composition *451*
corona 382, 388
microprobe analyses 326–328, **375, 389, 456**
mineral chemistry **565**
pressure–temperature–time study 325–332
Rb/Sr data **458**
texture and chemistry 376–377, 382
garnet migmatite 362
zircon SIMS dating 348–354, 358–359
garnet peridotite 372
garnet porphyroblast 571, 575
mineral chemistry 326, *330*
garnet–muscovite schist 573–575
geochemistry 73
Åreskutan Nappe 326–330
Finse Nappe 203–211
Helgeland 587–589, *590–593*
Lofoten islands 455–462
Mayo Trough *68, 69,* 70
Midland Valley Terrane 67, *68, 69,* 70
Revsegg Nappe 546–557
Seve Nappe 326–339
Tjeliken eclogite 372–379
Trondheim ophiolites 546–556, **557**
Vega complex 616–626
whole-rock composition 389, **391**
geochemistry, Baltica volcanics 3, 177–190
analytical methods 177–179, 184
element concentration and stratigraphy 184–189
geochronology
analytical methods 406
Åreskutan Nappe 343–355
eclogite metamorphism 249–251
geochronology study 69
basement domains 193–216
Espedalen Complex 231–238
gabbro-eclogite transition 415–418
Laurentian Caledonides 76–77
Lofoten islands 444, *445*
Svalbard 399
Trondheim ophiolites 546–547, 548–550
geological model (3D) for planned drill site *312, 317*
geophysical 3D modelling
Swedish Caledonides 311–316
geophysical surveys
Swedish Caledonides 301–303, 305–311
geotherm, calculation 427
geothermobarometry 385, 391–392, *394,* 396–397
Girvan Inlier 71, 76
glaciation 77, 78
Hirantian 136
Varanger 24
glaciogenic deposits 114
glass inclusions 187
Glenfinnan Group 52, 75
pegmatites 80

gneiss banded 390–391
gneiss complex 634–649
gneiss, basement 246
gneiss, granitic 666–667
gneiss, titanite/zircon analysis 209
Gothian crust 213–216, 237, 238
Grampian Fold Belt *496,* 497–498
Grampian Group 57
Grampian Highlands, structure 4
Grampian Orogeny 69, 157
  arc–continent collision 67, 73–75
  metamorphic peak 79, 80
  reconstruction *71*
Grampian Orogeny, kinematic model 467–506
  Dalradian Supergroup 468–469
  deformation (D_1, D_2) 483–485
  discussion 498, 501–504
  Highland Border Ophiolite 485–489
  models, older data 489–493
  new data 480–483
    model 493–497
  nomenclature 469
  subduction direction 483
  timing of events 475–478
Grampian Terrane 45–47, 49, 54–64
  mesostructures 478–480
  metamorphism 472–473
  stratigraphy 469–471
  structure 471–472
granite 445, 448, 672
  Lofoten-Troms 664–665
  magnetic susceptibility 305
  megacrystic 637–641, 645–647, 649
  S-type 603, 608, 619, 647
granite/granitoid
  Utsira High 513–515, 517, 518
granitic pluton 215
granodiorite 608, *609,* **613, 615**
granulite and eclogite metamorphism 425–439, 459
granulite facies 200, 211, 338, 340, 343, 356–358
  event 436–439
graptolite 70
gravitational extension 263
gravity data 303, 305, 316
gravity inversion modelling 311–316
gravity, residual *314*
Greenland Caledonides
  age of deposition 113
  central segment 100–101
  geological history 112–119
  metamorphism *116*
  northern segment *97–98,* 101
  research history 93–94
  sediment provenance 595–596, 599
  southern segment 95–100
Grenville Orogeny 49, 51, 54
Grenville–Sveconorwegian orogen 113, 150
  zircon signature 148, 151
Grong-Olden Culmination 258–259
Gula Complex, mica schist 563–579
  geology 569–571
  petrography and mineral chemistry 571–575

Hallingskarvet Nappe 199, *200, 214,* 215, 216
  titanite analysis 212
  titanite/zircon analysis 209–210
  zircon, titanite, U–Pb data **204–205**
Hanadalen Thrust Sheet 281
Hardanger-Ryfylke Nappe Complex 525, 526
Hardangerfjord shear zone 18
Hardangervidda nappe 200, 202
hastingsite 449, *450,* 451, 455, 462
heavy mineral assemblage *69*
Hebridean Terrane 49
Heggmo terrane 633, 636, 646
Helgeland Nappe Complex 604, *605*
  correlation 634
hematite 419, 429
Hf isotope data 4
  Dividal Group 167, *168*
Highland Border Complex 62, 63, *74*
  reinterpretation 79
Highland Border Downbend *479,* 481
Highland Border Ophiolite 64–66, 485–489
Himalayan tectonics 29, *500*
Himalayan–Alpine orogenic belt 1
Hoåsnebba, basement gneiss *256*
Hopen Pluton *454*
hornfels *487,* 488
hot springs 106
Humberian Orogeny 73
hydrocarbon reservoir 513

Iapetus closure 190, 245, 337, 361, 443, 525
  Appalachian–Caledonian 542–543
  Scotland/Ireland 45–47, 67, 73, 75–76
  timing 360
  Utsira (North Sea) 513–515
Iapetus Ocean 4, 45, 342
  crust 117
  opening 78–79, 114
  subduction *214,* 215
  suture 111, 112, 150
Iapetus rift-basin 271, 296
Iapetus, magmatism 597
  Lofoten-Troms 667–669
ICE hypothesis 679, 698
ID-TIMS (isotope dilution-thermal ionization mass spectrometry)
  see TIMS
Idefjorden terrane 195, *196*

IGCP (International Geological Correlation Program) 9, 10
ilmenite *411–414,* 419, 420, 429
imbricate thrusts 100, 278–281
imbrication and extension 261–263
imbrication, Gaissa Thrust Belt 293
imbrication, nappe 598
impact crater 136
inclusions 377, 380, 571, *573,* 574–575
  garnet 325–327, 332–333, *374, 376*
  zircon 203
indentor 497, 498, 501
International Geological Correlation Program 9, 10
Ireland
  Caledonides 45–80
  Dalradian Supergroup 57–59
  terranes *49,* 473, 475
isotope *see also* individual elements
isotope, analytical method 203, 515–517, 529, 532
isotopic age 52, 54, 59, 60, 72
isotopic composition 438
isotopic dating methods 387
isotopic variation, Vega complex 624–626

jadeite 332, 392, 393
Jæren Nappe *15,* 17, 202, 405
Jämtland Caledonides, tectonostratigraphy **134,** *135,* **141**
Jämtland Supergroup 136, *137,* 138
Jämtlandian nappes, zircon signature 149, 151
Jotun Nappe 10, 16, 18
  basement terrane 198, 200, 237, 238
  correlation 212–215, 225
jotunite 225–226, 230, 231
Jurassic, reburial 694

K/Ar date 681–682, 698
Kalak Nappe 10, 24–28, 29–30, *280*
  restoration model 289, 293
  zircon signature 150, 151
Kalak Nappe Complex 277, 633, 634, 636, 649
  age data 160–161
  displacement 296
  exotic origin 165–166
Karmsund Nappe 202
keratophyre 586, 588
Kilpisjärvi
  detrital zircon 164–165
klippen 28
Köli Nappe Complex 21–22, *132,* 151, 245
  density 307
Komagfjord Antiformal Stack 277
Kråkeneset Complex *427,* 429, 436
  concordia diagram Pb/U *435,* 436
  U–Pb data **430–431,** 434–435
Kunes Nappe 278–281
Kvalsida Gneiss 200, 209–211
  U–Pb data **204–205**
Kvitenut Nappe 202, 212–216, 526, *527*
kyanite 361, 429
  Åreskutan Nappe 332–333, 343
  pressure–temperature–time study 325–332

LA-ICP-MS (laser ablation-inductively coupled plasma-mass spectrometry) 52, 420, 662, 664
Labrador, sediment provenance 595, 599
Labradoria terrane 672, 673
laccolith 229, 234
Ladoga-Glint, zircon data 167
Laksefjord Nappe *280*
lamprophyre **229,** 230, 231, 235, 236
  concordia diagram *234*
landscape evolution 679–680, 696–699
large-ion lithophile element (LILE) 70
Laurentia *46*
  basement 54–57
  cover sequence 57–59
  crustal block 157
  foreland 49–51
  margin 10, *49, 74,* 100, 244, 245
  palaeogeography *12*
  passive margin 337
  provenance 57
Laurentian Caledonides, Scotland and Ireland 45–80
  arc–continent collision, timing 73–76
  foreland *48,* 49–51
  Grampian Terrane 54–64
  Midland Valley Terrane 64–71
  Northern Highlands Terrane 51–54
  outstanding controversies 76–80
  sedimentary basins 71–73
Laurentian continental fragment 633–650
Laurentian microcontinent 669
layered intrusion 229, 397, 438
  Cu–Zn deposits 22
Leirpollen Butressing Zone *280,* 281–282
Leka ophiolite complex 10
Leka, oceanic nappe 585–599
Leknes Group 444, 445, **446,** 448, 461
leucogranite 340, 357, 362
  Åreskutan Nappe 343
  U–Pb data 356
  zircon data 345, 348, **350,** 354, *359*
leuconorite *228*
Lewisian Gneiss Complex 49, *50*
Lewisianoid inliers 51

light rare earth elements (LREE) 67, 70, 73, 438–439
LILE (large-ion lithophile element) 70
limestone **134**, *137*, 340, 363
  Ordovician 135, 136
  Scandian 139
Lindås Nappe 10, 16, 31, 199–200, 213, 215, 421
  age 212, 404
  eclogite facies 5
lineation 246, 247, *255,* 342
  Grampian 478–480, 482–485, 488
lithostratigraphy
  Finnmark 271–278
  Greenland Caledonides *98*
  Spitsbergen *105*
Loch Awe Syncline 471, 489, *490,* 495–498, 505
Loch Eil Group 52
Lofoten islands
  basement 31
  basement, exhumed 23
  eclogite 369
  eclogite facies recession 443–463
  metamorphism/timing 445–448
  samples *445,* 448–455
Longford Down–Southern Uplands Terrane *72*
Lower Allochthon 160, 301, 404
  detrital zircon study **134,** 140, *142, 143,* 144, 149
  eclogite age 421
  tectonostratigraphy 246, 273, 337–338, 634
LREE (light rare earth elements) 67, 70, 73, 438–439
Lu–Hf age 162–165, 202, 215, 672
  Grampian 52, 54, 59
Lu–Hf analysis 162
  ICP-MS 662, 664
  terrain characterization 664–670
Lu–Hf isotope signature 671–672
  Dividal Group 167
Lu–Hf isotopes in zircon 547–548, **557**
Lu–Hf zircon isotopes 550–556, *593,* 594
Lunndörrsfällen sandstone, detrital zircon 144

mafic dykes 388, 397, 428
mafic magma 619–622, 624, 627
magma differentiation 619–622, 624
magmatic arc rocks 22–23
magmatic evolution 4–5
magmatism 47, *48*
  age **206–207,** 438
  Carboniferous–Permian 697
  early Neoproterozoic 113–114
  Grampian 59, 61
  Lofoten-Troms 667–669, 671–672
  Mesoproterozoic 436
  Midland Valley Terrane 70, 71
  rift-related 78
  Trondheim ophiolites 556, 558
  Vega complex 608–611
magnetic data 303, 307, 311
magnetic susceptibility 305, 316
  data **306**
magnetotellurics 311, 314
majorite 17, 18, 264
mangerite 236, 436, 447
mantle 18, 21, 427, 439
  depleted magma 664, 665, *669*
  enrichment 436
  exhumation 10–11
  plume 436
  serpentinized 79
  source 593, 668, 670, 671, 673
Marinoan glacial event 78
  tillite 138
mélange 16, 30, 64–66
  extensional 199
  ophiolitic 73
melt
  anatectic 361
  partial 362
  volume estimate 332–334
Meråker nappe 21
meta-igneous rocks, Helgeland 588
metaconglomerate, Helgeland 591–594
metagabbro, petrography 388, 409
metamorphic
  age 21, 107, 109, 213, 438
    Caledonian **206–207**
  assemblages 571–575
  gradient 100
  high grade 3, 4
  patterns 97, 99
  resetting 211, 212
  see also peak metamorphic
metamorphism
  Åreskutan Nappe 321–334, 356–357
  Arctic areas 101, 115–118
    Svalbard 385–399, 647
  Ireland/Scotland 61–67
  Lofoten 369, 443–463
  Scandian 30–31, *250*
  Seve Nappe 20–21, 321, 330–334, 356–357
    ultra-/high pressure 370–372, 379–380
  Tromsø 361, 667–669
  Western Gneiss Region 17–18, 249, 425–439, 459
metamorphism and deformation 52
  Dalradian Supergroup 58–59
metamorphism, inverted
  3D interpretation *310*
metamorphism, Seve Nappe *310*, 321, 330–334
  age 20–21
  ultra-high pressure 370–372
metarhyolite, U–Pb data 203, 209

metasediments
Helgeland 589, 591–594
Ofoten-Troms 671
metasomatic event 438–439
mica
composition *451*
electron microprobe analyses **456**
mineral chemistry **567**
Rb/Sr data **458**
mica-schist, staurolite–garnet–kyanite 563–579
mineral chemistry **565–569,** 571–575
pressure–temperature conditions 575–579
microtexture 420
Middle Allochthon 144–147, 149, 160, 301
age of subduction 421
detrital zircon *145*
tectonostratigraphy **134, 141,** 245–246, 275, 338, 404, 634
Midland Valley Microcontinent *494,* 495–497
Midland Valley Terrane *48,* 49, 54, 64–71, 67
migmatite 340, *342, 344,* 357, **613**
U–Pb data 339, 356
Vega 609–611
migmatite, garnet
Åreskutan Nappe 343
migmatization 358, 648
mineral chemical analyses 406–407, 409
mineral chemistry 326–330
Åreskutan Nappe 326–330
phengite eclogites, Svalbard 389–391
Richarddalen 389–391
staurolite **566**
Tjeliken eclogite 372–379
mining 229–230
Mohns Ridge 463
sea-floor spreading 448, 461
Moho 309, 489
Moine Nappe 52
Moine Supergroup *50,* 51–54, 77
metamorphism 80
Moine Thrust *53,* 75–76
molasse 251
Devonian 118
monazite *348,* 362, 428, 434–436, 448
age/dating 339, 356–358
Montblanc unit, cooling age 387
monzonite 199, 212, 213, 428, 435
age 429, 439
Western Gneiss Region 434
Morar Group 51–53
MORB (mid-oceanic ridge basalt)
magmatism 72, 78
Møre-Trøndelag fault complex 11, 18–19, 23
Motalafjella
subduction 398
Mullfjället Antiform 259, 340
digital elevation model 312
Munkavarri Imbricate Zone 279
muscovite stability 613–615
Mweelrea Syncline 69
mylonite 18, 31–32, 76, 110, 264, 488
Finnmark Caledonides 277
Seve Nappe 325, *342,* 357
Mylonite Zone 195
mylonitization *449,* 451
Myrland shear zone 451, *453,* 455, 461–462, 463
heating 460

nappe 16
correlation, S Norway 193–216
provenance *see* provenance, tectonic
restoration 3
Silurian 28
Naver nappes 52
Naver Thrust 75
Nb isotope data 618–619, **622**
depletion 189
Helgeland 588–589
NE Greenland Eclogite Province 101, 118
Neoproterozoic
basement 16
Caledonian overprint 80
Moine Supergroup 76–77
Newfoundland
accretion 80
Birchy Complex 79
ophiolite 70
sediment provenance 596–597
subduction 506
Newfoundland Appalachians 73
nickel 229
niobium in volcanic ash 187
Nordaustlandet
lithostratigraphy *105*
sedimentation 114
Nordfjord-Sogn detachment zone 11, 18–19
mylonite 31–32
Nordøyane UHP domain 257
norite 227, **229,** 230, 231
Nørreland allochthon 101
North Atlantic, opening 679, 696, 697
North Sea, offshore Caledonides 513–521
North Sea, rift 679, 696
North Varanger Terrane, displacement 296
Northern Highland Terrane, Scotland 45–46, *48,* 49, 51–54
anorthosite 428
Norwegian Caledonides
gabbro/eclogite transition 403–421
nappes 193–216
Novaya Zemlya *94,* 111, 167
Nupsfonn Nappe 202
Ny Friesland 104–106

obduction 30, 64–66, 75, 80, 244
  Grampian Orogeny 467, 468, 489, 491–497
oceanic affinity 17–18, 19, 21–22
oceanic crust 29, 334, 360
oceanic mélange 111
oceanic nappe, Helgeland 583–599
oceanic terranes, exotic 30
Ofoten-Troms, terrane correlation 655–673
  geology 657–661
  samples 661–662
Old Red Sandstone facies 136
Olden Antiform 258–259
olistolith, serpentinite 78
olistostrome 66
omphacite 379, 385, 429
  microtextures 380
  petrography *376,* 380, 391, *392*
Ongsjøfjellet Formation 235, *236,* 237
ophicarbonate 475, 486
  Highland Border Complex 79
ophiolite 17–18, 20–22, 202, 244
  Caledonides, Scotland/Ireland 49, 60–67, 70, 73
  formation 669–671
  mélange 66
  obduction 46, 67
  unroofing 69
ophiolites, suprasubduction zone 64–67, 541–558
Ordovician
  allochthon 525–537
  ash geochemistry *180,* 184, 186, 189
  ophiolites 541–558
  terrane characterization 656, 658, 660, 667–673
ore mineralogy 229–230
Ormtjernkampen outlier *227,* 234–235
orogenic cycle 45, *46,* 443
Orsa sandstone, zircon signature 140, 148
orthogneiss 404
  Richarddalen Complex 387–388
  titanite/zircon analysis 209
orthopyroxene
  Rb/Sr data **458**

P–T *see* pressure–temperature
P–T–t *see* pressure–temperature–time
palaeogeography *12,* 28–29, *178*
  Arctic 115
  Sauren-Torghatten 597, *598*
palaeomagnetic data 293
palaeomagnetic date 681
palinspastic restoration 131, 150, 285
  Finnmark Caledonides 271
Pangaea 1, 448, 463
Parautochthon 272–273
partial melt 263, 388
partial melt patches *252*
passive margin 10–11, 16, 680, 696, 697
  Laurentia 22
  sedimentation 20, 114
Pb–U age 355, 405, *417*
Pb/U ratio 343–344
Pb/U concordia plot *163, 234–236, 416–417, 432, 435, 436*
  detrital zircon *142, 143, 146, 147*
Pb/Pb age 209–211
  Åreskutan Nappe 348, 354, 355, 359
  baddeleyite 415, 416–417
  Grampian 54, 60
  Western Gneiss Region 434
peak metamorphic assemblage 380–382, *395*
  Tjeliken eclogite 372
peak metamorphic conditions 4, 17–18, 21, 106, 138
peak metamorphic pressure 356, 393
  Åreskutan Nappe 332–334
peak metamorphic temperature 332, 334, 356, 361
peak metamorphism, age 362, 399, 421
Pearya *108*
  deformation *116,* 118
  Greenland 112–113
  tectonic history 109–110
pegmatite 26, 199, 215
  Åreskutan Nappe *342,* 343, *357,* 362
  Bratten 641–645
  Devonian *248,* 249, 251
pegmatite dyke 455
  U–Th–Pb zircon data **353,** 355
pelitic gneiss *331*
  petrography 325–326
peneplanation, Cretaceous 698
pentlandite 229, 230
peridotite 17–18, 20–21, 264
  layered 438
peridotite, garnet 438
petrography
  pelitic gneiss 325–326
  Richarddalen Complex 389–391
  Tjeliken eclogite 372
  Vinddøldalen 409–410
petrology 249
petrophysics 305–307
phase equilibria calculations 393
phengite 356, 361, 381
  Åreskutan Nappe 325–326, *327,* 343
  geobarometry 332–333, 385, *388,* 391–397
  microprobe analyses **328,** *375,* 377–379, **390**
phengite-bearing eclogites, Svalbard 385–399
  metamorphic conditions 391–397
    and exhumation 398–399
  petrography and mineral chemistry 389–391
  pseudosection modelling 393–396
phenocyrst composition 178, 186, *187*

phlogopite *450,* 455, 459, 461
plagioclase 377, *388*
  Åreskutan Nappe 333
  data **612**
  microprobe analyses 326, *327,* **329,** 330, **378, 391**
plate tectonics 403–404, *491*
plutonism, Agder phase 213
polarity flip 493
polarity reversal, subduction 46, 71, 73, 75
pollen 251
porphyroblasts 449
Port Askaig Tillite 77
potential field data 305–309
  3D modelling 311–317
  seismic validation 311
pressure gradient 17
pressure–temperature conditions, Åreskutan Nappe
  evolution 332–334
  mineral chemistry 326–329, *330*
  p–t path construction 330, 332
  petrography 325–326
  tectonic implications 333–334, 343
  thermodynamic modelling 330
pressure–temperature estimates
  Tjeliken eclogite 379, *380*
pressure–temperature pseudo-section *576,* 577
pressure–temperature–time study
  Åreskutan Nappe 325, *332*
  garnet 325–332
pressure–temperature, conditions 17–18, 52, 249, 563
  Biscayarhalvøya *394,* 396–397, *398*
  Grampian Terrane 79
  Greenland Caledonides *99,* 101, 104
  Irish Dalradian 58–59, *61,* 62
  Midland Valley Terrane 54, 64–66
  Scandian event 75
  Tjeliken eclogite 372, 380–382
  Western Gneiss Region 249
protolith age 20–21, 251, 339, 421, 439, 640
  Arctic areas 107
  basement 195, 211, 213, 216
  Richarddalen Complex 387
  Scandes 134
provenance study, Dividal Group 157–170
provenance, sediment 3, 362
  detrital zircon 63, 73, 149
    Dividal Group 157–170
  Greenland 595–596, 599
  Helgeland 594, 595–597
provenance, tectonic *214,* 215–216
  Bratten-Landegode complex 646–648
  Caledonian nappes 212–213, *214*
  Hardanger-Ryfylke Nappe Complex 525
  nappe 4, 5, 216, 237, 646–648
  Seve Nappe Complex 358–360
Psammitic schist, zircon signature 144, 147
pseudosection modelling 385, 393–396, *397*
  Tjeliken eclogite 380, *381*
pyroxenite *228,* 230
pyroxenite, garnet 438
pyrrhotite 230

radiation damage, fission track 691–693
radiogenic isotope analyses 455, 457
radiometric age
  Grampian terrane *476*
  Utsira High *519*
rapakivi granite 245
rare earth element (REE) 186
Rätan granite 307
  magnetic susceptibility 305
Rb–Sr age 4, 106, 387, 406, 680
  basement 202, 212
  Lofoten islands 444, *445,* **446,** 459–463
  Ofoten-Troms 672
Rb–Sr analyses 455
Rb–Sr data 193
Rb/Sr age
  Grampian 59, 60
Rb/Sr data 457, **458**
Re–Os age 438
recumbent folds
  Devonian 249, 253, 255, 259, *262*, 263, 265
  Grampian 473, 480, 488–489, 492, 498, 501
REE (rare earth element) 186
reef mound 136
regression 388, 563, 575, 578
  eclogite facies 443–463
regressive assemblage 382
Reisadalen
  detrital zircon 164
  source area 167
Rekdalshesten Antiform *260,* 261, 265
reke 261
relict phlogopite 461
research, Caledonides 1
  current status 2–5
  overview map *2*
resetting 238, 436, 461
  U–Pb 435
restoration, External Caledonides
  Finnmark 271–296
retrograde
  amphibolite 406, 419
  assemblage 372
  eclogite 397, *410*
  titanite *413*
Revsegg Nappe 202, 215, 525–537
  correlation 536–537
  evolution 535–536
  geology 526–529
  mineral ages 534–535

reworking, Western Gneiss Region 428
Rhinns Complex 57
rhyolitic, source magma 184, 186–189
Riar Basin 264, 265
Richarddalen Complex
  age 387
  eclogites 395–399
rift–drift transition 245
rifting 29, 338
  Iapetus 114
  Late Neoproterozoic 78
  Mesozoic 696
  North Sea 697, 699
roche moutonée, Marinoan 282
Rodinia 29, 77, 114
  break-up *158,* 160
  sedimentation 112–113
Rødør, oceanic nappe 585–599
Røssjøkollen gabbro 237
Røssjøkollen outlier *227,* 234–235
Ruoksadas Thrust Sheet 279–281
rutile *392, 412, 413,* 419, 420, 434
  porphyroblasts 449
Rybachi Terrane, displacement 296

sag basin 112, 114, 169, 187
Saib Hatat fold nappe *500,* 501
sanidine phenocrysts 179, 186, 187, 188
Särv nappes 138
  magnetic susceptibility 305
  zircon signature *132,* **134,** *135, 145–146,* 150–151
Sauren-Torghatten Nappe
  tectonic evolution 585–599
Scandes
  tectonostratigraphy 134, 135
  zircon study 133
Scandian
  collision 5, 31, 360, 447–448
  deformation 636
  event 157, 337, 340, 647
  metamorphism *250*
    ultra-high pressure 30–31
  phase 213, 215, 650
  shear zone 257
Scandian Orogeny 18, 45–47, 52, 334, 360–362
  Northern Highlands Terrane 75–76
Scandinavian Caledonides 9–32, 111, *302*
  cross-section *25*
  discussion 28–32
  Finnmark 271–272
  history of research 9–10
  nomenclature 5, 10–11, **13**
  tectonostratigraphy 11–28
scapolite 426, 429
Scotland
  Caledonides 45–80
  Dalradian Supergroup 57–59
SDDP (Swedish Deep Drilling Program) 303
sea-floor spreading 461, 463
  Mohns Ridge 448
secondary ionization mass spectrometry *see* SIMS
sediment
  restoration, depositional areas 293–296
  thickness estimate 296
sedimentary basin
  Longford Down–Southern Uplands 71–73
sedimentation
  Dalradian Supergroup 77
  Greenland 112
  Midland Valley Terrane 70–71
seismic reflection
  accretionary prism 76
  COSC drill site 309
seismic reflection profile 259, 389–391
  Byxtjärn-Liten line *310*
semi-pelitic schist, zircon signature 148
serpentinite 139
serpentinite olistolith 78
serpentinized mantle 79
Seve Nappe Complex 3, 29–30, *132, 135,* 213
  COSC drilling target 303
  density model 314
  digital elevation model *312*
  eclogite age 405
  emplacement 360–362
  geological model 316
  geophysical investigation 305
  gravity 309
  metamorphism 20–21, 321, 330–334
    inverted *310*
    timing 356–357
    ultra-/high pressure 370–372
  tectonostratigraphy **134,** 138, **141,** 323–325, 339–343
  zircon signature *142,* 144, *145,* 148–151
Severnaya Zemlya *94,* 111, 112
  zircon age 167
Sgurr Beag Nappe 52
Sgurr Beag Thrust 75, 77
shear 246–247, 256, 263–264
shear bands 389
shear fabric 251, *252*
shear sense indicators 528
shear zone 325, 342
  eclogite facies 427, 443–463
shear zone, Lofoten islands
  samples/location *445,* 448–455
sheath fold 246, *247,* 249, 264
Shetland 64, 520
  geochronology 76

shortening
Baltoscandian margin 363
and displacement 291–292
estimation using balanced cross-section 285–287, 289
Finnmark Caledonides 277, 279, 281–287
Siljan Ring 136, 140
sillimanite *344*
Silurian
ash geochemistry **182–183,** *185,* 186–189
terrane characterization 658, 660, 669, 671
SIMS U–Pb (secondary-ion mass spectrometry) 633
Åreskutan nappe 337–363
Bratten-Landegode 633, 640–641, **644**
Landegode granite 640
SIMS U–Pb analyses 3, 415–418, 420
SIMS U–Pb concordia plot *346–347*
SIMS U–Pb protocol 407–409
SIMS U–Pb zircon geochronology
data **350–353**
methodology 343–344
samples 343, **349**
Skagen shear zone *454,* 455, 460, 462–463
Skarddøra Antiform 259, 261
Skibotn-Tromsø transect *659,* 660–661, *670*
Skiippagurra Fold Belt 282–285
restoration models 292
slab
break-off 18, 47, 73, 117, 361
obduction 80
roll-back 627
subduction 243, 497, 501–504
Slishwood Division 59–62
Sm–Nd age 202, 249, 358, 382, 425, 671–672
Åreskutan Nappe 323
disequilibrium 372
Grampian 51, 52, 54, 57, 59, *61,* 66, 67
Tjeliken eclogite 371
Western Gneiss Region 438
Sm–Nd isotopes 546
Sm–Nd method 339, 340
smectite 186
Solund-Stavfjord Nappe 202–203
Sørkapp Land, unconformity 114
Sørøy succession 25–27, 28
source terrains 362
detrital zircon 355, 360
South Mayo Trough 67–70
collision 76
unroofing 73
Southern Uplands accretionary prism 71–73
Southern Uplands–Longford Down Terrane 49
sparagmite 223, 230, 237
Spitsbergen
Neoproterozoic orogeny 112–113, 114–115
Spitsbergen Caledonides 102, 106–109
lithostratigraphy *105*
Spitsbergen, phengite-bearing eclogites 385–399
spores 244
Sr isotopes 618–619, **622**
Sr/Sr ratio 457
srilankite 420
St Petersburg, zircon data 169
staurolite
mineral chemistry **566**
staurolite–garnet–kyanite assemblage 563, 571–573
stilpnomelane 486–489
Stoer Group 49
Støren Nappe 21, 261, *262,* 543
Storhø Nappe 225
Storli Thrust *255,* 257, 258–261
out-of-sequence 262–263
westward extension 265
strain 291
stress axes, stereoplot *281*
strontium in volcanic ash 187
Sturtian glacial event 77, 78
Stylskampen suite 229, 237
laccolith 234
subduction 245
Baltica 241, 243, 334
Baltica–Laurentia 323, *362*
depth 356
flip *476,* 478, *494,* 506
Grampian 467, *476, 479,* 483, 489, 503–505
timing 118
ultra-high-pressure tracers 369
Suldal Nappe 202, 203, 209, 213
age 212
zircon and titanite 208–209
zircon, titanite, U–Pb data **204–205**
sulphide deposits 22, 229–230
Sunnhordland Nappe 202
Sværholt succession 25–26, 28
Svalbard 648, 649
geology and age 387
Grenvillian age 167
metamorphism 647
phengite-bearing eclogites 385–399
Svalbard Caledonides 93, *94,* 101–109, 111
Andrée Land 106
Nordaustlandet 103–104
Ny Friesland 104–106
Svecofennian Domain
age and geology 158–159
Sveconorwegian
events 213, 216, 236, 237
province 158, 160
rotation 214
terrane 195–203
Sveconorwegian Orogen 135
U–Pb age overview **206–207**
zircon signature 148

Sveconorwegian orogeny 238
  age 212–213
Sveconorwegian terranes *437*
Swedish Caledonides
  3D interpretation 301–317
Swedish Deep Drilling Program 303
syenite, Utsira High 513, 515, *517,* 518, 519
Synnfjell Nappe 225

Taconian event 157, 636
Taconian orogeny 514, 517, 518, *519*
Taconian phase 634
Taconic Orogeny 73, 75
  ophiolite 79
Tay Nappe 4, 57, *469,* 495–505
  earlier models 489–493
tectonic burial, Lofoten islands 443
tectonic evolution, eastern Baltic 177
tectonic map
  Finse Nappe *200*
  Ireland and Scotland *47, 50, 55*
  Norway *194, 224, 242*
  Scandes *135*
  Scandinavian Caledonides *132, 159, 302, 322, 338, 370*
    central *19*
    north *24*
    south *15*
tectonostratigraphic units 404, 634
  nomenclature **13**
tectonostratigraphy *26–27, 48*
  mid-Norway *242,* 243–246
  Trollheim 404–406
tectonostratigraphy, S Norway *194, 196, 200*
  Caledonian nappes 197–203
  Lower Allochthon 246
  Middle Allochthon 245
  Precambrian basement 195–197
  sedimentary cover 197
tectonostratigraphy, Scandinavian Caledonides **134**
  central segment *12,* 19–23
  nomenclature **13**
  northern segment *12,* 23–28
  southern segment 11–19
tectonothermal events
  Åreskutan Nappe *357*
Telemarkia
  age 212, 438
  crust 215–216, 237, 238
  terrane 195–197, 213, *214*
terrane reconstruction *71*
terrane tracer 649
terrane, abandoned term 95, 119
terranes
  Iapetus 4–5
  Scottish Caledonides 49
  Sveconorwegian *196*
Th/U ratio 354, 355, 415
thermal history modelling 683, 693–696, 698
thermal ionization mass spectrometry
    see TIMS
thermal relaxation 79
thermobarometry 3, 4, **568,** *575,* 579
  Vega complex 611–615
thermochronology 683, 688–697
thermodynamic modelling
  Åreskutan Nappe 330–332
  Tjeliken eclogite 380
thermometry 613, *614*
thick-/thin-skinned belts 101
ThO/U (ThO/UO) age 416–418
tholeiite 112, 342
Trollheimen, event sequence 257
thrust belt, restoration model 284–291, 294, 295
thrust emplacement 243, 257, 258–261
  timing 636, 649
thrust imbrication 257–263
thrust sheets 95, 100–101, 404
  Scandes 133
thrust tectonics 3, *214,* 215–216, 340
  Caledonian 99–101
thrust, out-of-sequence 253–257, 261
tillite 20, 77, 136
Timanian foreland basin
  depositional model 168–169
  provenance study 157–170
Timanian orogeny 112, 115, 150, 161
Timan Basin, restoration 294
Timanide Orogen 166–167
TIMS (ID) U–Pb
  (isotope dilution-thermal ionization mass spectrometry)
  Bratten-Landegode 633, 640–641, **642,** *643,* 645
  data 3, 427–428, **663**
  date 405, 526
  concordia plot *417*
  methods 662–664
  samples 661
TIMS U–Pb analyses 415, 420–421, 526
  baddeleyite 415–416
TIMS U–Pb protocol 406–407
titanite 202, 251, *413,* 429, 436, *450,* 451
  age 213, 257, 339, 387, 397–398
  analytical methods 203, 231
  Baltican basement *253*
  correlation of nappes 211–216
  discordant data 198–199
  Espedalen Complex 231–237
  microprobe analyses **391**
  U–Pb dating **204–205,** 358
  Western Gneiss Region 434
titanite, basement domain correlation 203–216
titanomagnetite *411,* 419

Tjeliken eclogite 369–382
discussion 380–382
geological setting 372
mineral chemistry and petrography 373–379
pressure–temperature estimates 379, *380*
thermodynamic model 380
ultra-high-pressure units 370–372
Tømmeråsen Antiform 259
tonalite 672, 673
Lofoten-Troms 664–665
topography 679, 697–698
Torneträsk–Lofoten transect 661, *670*
Tornquist Sea 46
trace elements 178, *180–181, 185,* 186, 188
transpression 118
Transscandinavian Igneous Belt 133
magnetic anomaly 307
magnetic susceptibility 305
zircon signature 148, 149, 150
Trollfjorden-Komagelva Fault
restoration 292–293
Trollheimen antiformal window 405
Trollheimen, structure 246, *247,* 258–263
nomenclature 264
Trollheimen, thrusts 253–265
Tromsø Nappe 369, 667–669, 672
eclogite 115, 405
ultra-high-pressure metamorphism 361
Trondheim, ophiolites 541–558
geochemistry 546–556, **557**
lithology 543–546
Trondheimfjord, intrusions 251
tuffite, zircon and titanite 236
turbidite 136, 149
Arctic areas 114, 117, 595, 596
Åreskutan Nappe 334, 338, 340, 360
Timan Basin 277, 293, 294
Tyrone Central Inlier 59–62
Tyrone Igneous Complex *60,* 67, 477
Tyrone Ophiolite 493, *494*
Tyrone Plutonic Group *60,* 64, 66
Tyrone Volcanic Group 70

(U–Th)/He analyses 679–699
ages 688–691, 696, 698
U–Pb age 4, 245, *248,* 358, 372, 404
Arctic region 104, 106–107, 109, 110, 398
Åreskutan Nappe 323, 325, 339
Caledonian nappes 200, 202, 203, **204–207**
Devonian 249, *250*
Dividal Group 158, 162–165
Grampian 52, 54, 59
Gula Complex 546–550, **557**
Helgeland 594–598
Ofoten-Troms 664–667, *670,* 672
Revsegg Nappe 530–535
U–Pb analyses 162
methods 139, 203
U–Pb data 202, 356
Norway, south 193, 203–211
Western Gneiss Region 425–439
U–Pb discordance 198, 203, 209–211, 236
U–Pb geochronology 256, 387, 403
analytical procedure 429–435
U–Pb geochronology, Espedalen Complex
analytical method 231–235
data **232–233**
interpretation 235–238
U–Pb method 339
U–Pb SIMS *see under* SIMS
U–Pb systematics
multiple metamorphic events 434–436
U–Pb TIMS *see under* TIMS
U/Pb age 447–448
U/Pb calibration 344
U–Th-total Pb
monazite 325
ultra-high-pressure metamorphism 241, 243, 249, 362
Åreskutan Nappe 323, 325–334
domains 264
eclogites 263
Ordovician 245
Tjeliken eclogite 369–382
ultra-high-temperature metamorphism
Åreskutan Nappe 321–334
ultra-mafic/mafic rocks 586, 599
ultramafite 227, **229,** 230
underplating 213
underthrusting 334, 363
uplift
Cenozoic 679–680
Mesozoic 697–699
Western Gneiss Region 5
Upper Allochthon 301, 583, 636, 672
tectonostratigraphy **134,** 149, 160, 244–245, 404, 563–564
Uppermost Allochthon **134,** 161, 244, 301, 398–399, 404
provenance 633–636, 648–649, 672–673
Utsira High, magmatism 513–521
correlation, N Atlantic region 518–521
geological setting 513–515
samples and analytical methods 515–516
zircon analyses 516–517, *518*

Vågje
Ar/Ar age *452*
heating 460
shear zone 461, 462, 448–451
Valdres Nappe 223, 225
Valdres Sparagmite 197, 198
Vandredalen thrust sheet 101

Vanna, basement 23
Varanger glaciation 24
Varanger peninsula 165
Variscan orogeny 118
Vega Intrusive Complex 603–628
  geochemistry 616–626
  magmatic rocks 608–611
  timing and emplacement 615–616
Vemdal sandstone, zircon signature 140, 150
Vestvågøy
  shear zone 448–451
Vinddøldalen
  age of gabbro 420–421
  petrography 409–410
  tectonostratigraphy 405–406, **407**
Virisen Terrane 138
volcanic arc
  magmatism, Utsira High 517, 520, 521
  terrane 67–70
volcanic ash, geochemical analysis 177–184
volcanic rocks 21–22
  Timanian 161
volcanics
  Cenozoic–Quaternary 106
  Ordovician 244
  Ordovician–Silurian 184, 244
volcanites 259, 307, 312
Votjtja quartzite, zircon signature 148

websterite *228*
West Troms basement complex 31
Western Gneiss Complex 10, 17–18, 23, 30–31
  ultra-/high-pressure metamorphism 4
Western Gneiss Region 241, 404, 405
  age 421
  basement 246
  basement window 428
  eclogite province 369
  metamorphism 249
    ultra-high pressure 425–439
  tectonostratigraphy 197
  U–Pb geochronology 429–435
  uplift 5
white mica 73
WINCH seismic profile 489
Window Allochthon 273–275
within-plate affinity 66

xenocryst 428, 672
xenolith 67, 227, 427, 619

zircon *see also* detrital zircon
zircon 198–199, 213 *see also* detrital zircon study
  analytical methods 203, 231, 343–344
  bead 414–416, 421
  correlation of nappes 211–216
  inert 420
  population result 3, 344–345
  SIMS analyses *see under* SIMS
  textural types 410–415
  TIMS analyses *see under* TIMS
zircon age 167, *435,* 664–667, *670,* 672
  Arctic Caledonides 109
  Espedalen Complex 231–238
  Greenland 107, 113
  Gula Complex 546–550, **557**
  Helgeland 594–598
  Laurentian Caledonides 49, 57, 60, 62, 64–67, 78, 80
  Revsegg Nappe 530–535
  Scandinavian Caledonides 18, 20–21
  Trollheim 407–409
zircon data, discordant 198, 199
zircon formation, gabbro/eclogite transition 403–421
  geochronology 415–418
  methods 406–407, 409
  petrography 409–410
zircon-forming processes 418–421
zircon, basement domain correlation 193, 203–216
zircon, inert 420
zircon, titanite, U–Pb data **204–205, 232–233**
zirconium 356, 357, 406, 418–421
  in volcanic ash 187
zoning 211, 355, 568, 575
  apatite *690*
  garnet *374,* 391, *393*
  zircon 348, 356, 403, *433*