

Index

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

- Abenab Subgroup, 201
stratigraphy, 201
- abiotic dolomite, 76
- Abu Mahara Group, Jabal Akhdar, 259, 251–260
boundary relations, 258
carbon-isotopic data, 256
chemical and mineralogical indices of alteration, 258
chemostratigraphy, 256
CIA, 256
geochronological constraints, 258–260
geological map, 253
glaciogenic deposits and associated strata, 253–256
Hadash Formation summary log, 257
histograms of zircon ages derived by LA-ICPMS, 259
Neoproterozoic outcrops and salt basins of Oman, 252
palaeolatitude and palaeogeography, 258
sedimentological logs through Fiq Formation, 254
stratigraphy, 253
structural framework, 252–253
zircon geochronology, 259
- Acaciella australica* Stromatolite Assemblage, 122, 125
- Acraman impact structure, 674
- Adelaide Geosyncline
map, 714
relationship of major lithostratigraphic units, **703**
- Adelaide Geosyncline, South Australia, 673–675
Acraman impact structure, 674
basement geology, 703
biostratigraphy, 674
chemostratigraphy, 673–674
early rifting, 703
geochronological constraints, 674
glaciogenic deposits and associated strata, 673
Mid-Ediacaran ice-rafting, 673–675
palaeolatitude and palaeogeography, 674
stratigraphy, 673
structural framework, 702–704
Sturtian rifting, 703–704
tectonic subdivision, 702–703
- Adelaide Geosyncline Cryogenian glaciogenic formations, 715
- Adelaide Rift Complex locality maps, 694
- Adrar area stratigraphy, 165
- Africa
geological sketch map, 186
Kaigas and Numees formations, Port Nolloth Group, 223–230
Karoetjes Kop and Bloupoort formations, Gifberg Group, 233–237
Katanga Supergroup, 173–182
knowledge base, 12
Neoproterozoic glacial palaeolatitudes, 104–105
Neoproterozoic ice age data set, **3**
Port Nolloth Group, 223–230
Taoudeni Basin, 163–169, 167
West Congo Supergroup, 185–192
- Agassiz, L., 20, 29
- Aisa Formation stratigraphy, 321
- Aitken, J. D., 25
- Akademikerbreen Group, 577
- Akkajaure Nappe Complex, 609
- Aksu–Wusi area
composite stratigraphic log, 371
geological map, 370
glaciogenic diamictites, 369–370
- Akwokwo Tillite, 191
- Alaska, 389–395
Hula Hula diamictite, 379–385
- Aldan Shield, 302
- Altaids, 100–101
- Altungol diamictites, 372
- Altungol Formation stratigraphy, 370
- Amadeus Basin, 688
glaciogenic deposits and associated strata, 684–685
Inindia beds, 685
Pioneer Sandstone, 685
- Amazonia and environs, 105
- Andrée Land Group
glaciogenic deposits and associated strata, 586–587
stratigraphy, 583–584
- Antelope Island, 430
- Anti-Atlas Mountains of Morocco, 105
- Araçuaí orogen, SE Brazil, 523–531
- aragonite cements, 76
- Araras group, 489, 495
glacially influenced sedimentation and carbonates, 487–496
northern Paraguay Belt stratigraphy, 491
- Arctic Alaska–Chukotka Plate (AACP), 390
- Arena Formation, 587
- Areyonga Formation, 684–685
- Argentina Tandilia System, 565–568
- Arroyo del Soldado Group stratigraphic chart, 550
- Aruwimi Group, 189
- Assem Limestone, 273
- astronomical theories on Neoproterozoic glaciation, **26**
- Atar Group, 105
- Aties Formation, 234
- Atud diamictite
boundary relations, 281
geochronological constraints, 282
glaciogenic deposits and associated strata, 281
location, 280
- Australia, 673–675, 693–698. *See also*
biostratigraphy of Australia
biostratigraphy, 113–130
cap-carbonate sequences, 73–74
glacial succession of Sturtian age, 701–710
glaciogenic succession map, 12
global correlation, 126–129
Kimberley Region, 659–671
knowledge base, 14–15
Nackara Arc, 69, 706, 715–716
Neoproterozoic ice age data set, **13**
palaeoequators, 103
palaeomagnetic constraints on Neoproterozoic glacial palaeolatitudes, 102–103
stromatolites, 121–125
Sturt glaciation stratigraphy, 124–125
- Australia, central, 677–688
boundary relationships, 686
cap dolomites, 678–681
characteristics, 687
chemostratigraphy, 686–687
geochronological constraints, 687
glaciogenic deposits and associated strata, 682–686
Neoproterozoic basins, 682
Neoproterozoic glacial deposits, 677–688, 678–681
Neoproterozoic stratigraphy, 682, 683
palaeolatitude and palaeogeography, 687
structural framework, 677–682
- autochthon, 606–607
- Avalon assemblage, 146
- Avalonia palaeomagnetic constraints, 105
- Avalon Peninsula
map, 468
rocks, 468
stratigraphy, 469
- Ayn Formation, Dhofar, Oman, 239–247
boundary relations, 243
carbon-isotope composition of post-glacial carbonate, 243
chemostratigraphy, 243–245
frequency distribution of detrital zircons from Mirbat Group, 246
geochronological constraints, 246–247
glaciogenic deposits and associated strata, 241–243
carbonate facies, 243
carbonate-filled fissures, 243
carbonate mass-flow facies association, 243
distal glaciomarine facies association, 241–243
fluviodeltaic facies association, 241
post-glacial carbonate, 243
proximal glaciomarine facies association, 241
shallow-water facies association, 243
subaerial facies association, 241
- MIA in Mirbat Group, 245
- Neoproterozoic glaciation, nature, 247
- Neoproterozoic weathering, chemical index of alteration (CIA), 243–245
- outcrop areas of Neoproterozoic basement, 240
palaeolatitude and palaeogeography, 245–246
sedimentological logs of Ayn Formation, 242
stratigraphy, 241
structural framework and basement geology, 239–241
summary log data, 244
- Backbone Ranges Formation, 399
- Baicalia burra* Stromatolite Assemblage, 123
- Baikal Group, 325
- Bakouma Basin, 190
- Bakoye Group, 165
- Baltica, 100
- Baltoscandian craton, 620
- Baltoscandian ice sheet, 619
- Bambuí formation correlations, **511**
- Bambuí Group, Southern São Francisco Basin
glaciogenic deposits and associated strata, 512
lithostratigraphic and chemostratigraphic correlations, 516
Neoproterozoic successions, 509–519
stratigraphy, 537
- banded iron formation (BIF), Egypt
boundary relations, 281
geochronological constraints, 282
glaciogenic deposits and associated strata, 281
- Bângonâive window, 626
- Bangui Basin, 190
- Barakun Formation, 298
- Baratta Trough, 706–707
- Barents Shelf, 571
- Barite mineralization, 67–77, 169
- Basal Mahd Group diamictite, central Arabian Shield, 277, 280
boundary relations, 281
geochronological constraints, 282
- Bas-Congo Basin, 187–188
- Baydaric microcontinent, 331
- Bayixi Formation
glaciogenic diamictites, 372
stratigraphy, 370
- Baykonur Formation, 303–306
age, 306
boundary relations, 305

- Baykonur Formation (*Continued*)
 characteristics, 305
 chemostratigraphy, 305
 conglomerates, 305
 dolomite, 305
 geochronological constraints, 305
 glaciogenic deposits and associated strata, 303–306
 outcrops, 304
 palaeolatitude and palaeogeography, 305
 sandstones, 305
 sedimentary environments, 305–306
 shales, 305
 stratigraphy, 303
 structural framework, 303
 type sections, 304
- Bebedouro Formation
 geological map, 504
 ice-contact glaciomarine system, 505
 schematic representation of glacial lithofacies, 506
 Una Group, Bahia (Brazil), 503–507
- Beck Spring Dolomite, 464
 Beck Spring Formation, 464
 Bedgroup 19, 586
 Bedgroup 20, 586–587
 Bethanis Member, 199
 bidirectional climate change, 20
 Biexibastao Formation
 glaciogenic diamictites, 374
 stratigraphy, 373
- Big Cottonwood Formation, 428
 Big Creek roof pendant map, 440
 Billy Springs Formation, 697
 Billy Springs glaciation, South Australia, 693–698
 Adelaide Rift Complex locality maps, 694
 boundary relations, 696
 chemostratigraphy, 696
 geochronological constraints and biostratigraphy, 696–697
 glaciogenic deposits and associated strata, 694–696
 Mid Ediacaran palaeogeography, 697
 palaeolatitude and palaeogeography, 696
 stratigraphy, 693–694
 structural framework, 693
- Bimbo sandstones, 190
 bimodal volcanic rock, 439
 biogenic dolomite, 76
 biological theories, 26
 biostratigraphy of Australia, 113–130
 Bitter Springs anomaly, 55, 57
 Blackrock Canyon Limestone stratigraphy, 429
 Black Stump Arkose, 686
 Blackwelder, Eliot, 21
 Blaini Formation of Lesser Himalaya, India, 347–353
 age plot for detrital zircons, 353
 boundary relations, 352
 chemostratigraphy, 352–353
 diamictites, 350
 dolomite, 350–352
 geochronological constraints, 353
 geological map of fold-and-thrust belt, 348
 glaciogenic deposits and associated strata, 348–352
 interpretation, 349–350, 352
 lithostratigraphic and biostratigraphic subdivision, 349
 lithostratigraphic sections and chemostratigraphy, 351
 locations of measured sections, 350
 massive and laminated diamictite lithofacies, 348–349
 Neoproterozoic–Cambrian succession, 349
 palaeolatitude and palaeogeography, 353
 sandstones, siltstones and shales, 350
 significance of isotopic analyses, 352–353
 stratigraphy, 348
 structural framework, 347–348
- Blaubeker Formation, 213, 215
 glaciogenic deposits and associated strata, 213
 Bloeddrif Member, 227–228
 Bloupoort Formation, 233–237
 boundary relations, 235
 chemostratigraphy, 235–236
 correlation of diamictite, 237
 diamictite-hosting, 235
 glaciogenic deposits and associated strata, 234–235, 235
 palaeolatitude and palaeogeography, 236
 structural framework and tectonic evolution, 233–234
- Bocaina Formation, 493
 Bogenfels Formation, 220
 Bokson Group
 age, 285–288
 boundary relations, 286
 characteristics, 286
 chemostratigraphy, 286
 diamictites, 287
 geochronological constraints, 287
 geographic position, 286
 glaciogenic deposits and associated strata, 285–288
 lithological and chemostratigraphic succession, 287
 palaeolatitude and palaeogeography, 286–287
 sedimentary environments, 287–288
 stratigraphy, 285–286
 structural framework, 285
- Bolla Bollana Tillite, 707
 Bol'shoi Patom Formation, Lena River, central Siberia, 309–315
 associated strata, 310–312
 boundary relations, 313
 carbonate congl-breccias, 312
 chemostratigraphy, 313
 composite sections, 311
 conglomerates, 312
 correlation between Vendian and Ediacaran Systems, 313
 diamictites, 311–312
 massive, 311–312
 stratified, 312
 geochronological constraints, 313–315
 geographic distribution, 310
 glaciogenic deposits, 309–315
 lithostratigraphic section, 310
 mudstones and siltstones, 312
 palaeolatitudes and palaeogeography, 313
 sandstones and grits, 312
 stratigraphy, 309
 structural framework, 309, 310
 subordinate rocks, 312
 succession of Patom Supergroup in Ura Uplift, 311
 typical structures in diamictites, 312
 Upper part of Mariinskiy Formation, 310
- Bonahaven Formation, 637–638
 Boonall Dolomite, east Kimberley, 666–671
 glaciogenic deposits, 668
 Boondawari Formation, 684
 Boord Formation, 685
 Børgefjellet window, 626
 boron isotopes, 203
 Boston Basin, Massachusetts, USA, 475–479
 boundary relations, 477
 characteristics, 478
 chemostratigraphy, 477
 geochronological constraints, 478
 glaciogenic deposits and associated strata, 477
 map of outcrops, 476
 palaeolatitude and palaeogeography, 478
 Squantum Member, 475–479
 stratigraphic framework of lithostratigraphic units, 476
 stratigraphy, 476
 structural framework, 475
- Boston Bay Group, 478
- Brasilia Fold Belt
 chemostratigraphy, 514–515
 geological map, 513
 Bråvika member, 576
 Brazil
 Jeiquitaí Formation, 541–545
 Neoproterozoic Macaúbas Group, 523–531
 Una Group, 503–507
- Brigham Group
 stratigraphy, 429
 stratigraphy showing available carbon isotope data, 429
- Brookline Member, 477
 Buckland, William, 20
 Buenos Aires Complex, 565
 Buldya Group palynomorphs, 118
 Buryatian Republic, 285–288
 Buschmannsklippe Formation, 213
 glaciogenic deposits and associated strata, 214
- Cadomia, 105
 calcium isotopes
 Canadian Cordillera Mackenzie Mountains, 404–405
 Otavi carbonate platform and foreslope, northern Namibia, 203
- Caledonian age
 position of Hedmark, Valdres and Engerdalen basins, 618–619
- Caledonian mountain belts, 583
 Caledonides of Scandinavia, 603–609
 boundary relations, 608
 chemostratigraphy, 608
 evidence of late Neoproterozoic glaciation, 603–609
 geochronological constraints, 608
 glaciogenic and associated deposits, 604, 606–608
 palaeolatitude and palaeogeography, 608
 palinspastic cross-section showing development of inboard and outboard basins, 604
 regional stratigraphic profiles, 605
 stratigraphy, 605–606
 structural framework, 603–605
- Cambridge Formation, 477
- Canada
 cap-carbonate sequences, 74
 Cordillera Mackenzie Mountains, 397–409
 global correlation, 126–129
 Windermere Supergroup, 413–421
- Canadian Cordillera, 413–421
 Canyon Formation, 587
 carbon isotopes, 51–62
 current knowledge base, 6–14
 Cariboo–Purcell–Rocky Mountains stratigraphic columns, 415
- Carrancas diamictites, 531
 Central Australia, 677–688
 Central Flinders Ranges, Holowilena, South Australia
 glaciogenic deposits and associated strata, 695–696
 iron and manganese deposits, 69
 Central Flinders Zone, 716
 glaciogenic deposits and associated strata, 715–716
- Central Scandinavian Caledonides, 623–627
Cerebrophaera buickii from Spitsbergen, 119
- Cerro Largo Formation, 566
 Cerro Negro Formation, 566
 Chambers Bluff Tillite, 684
 Chambishi Basin, 178
 Chameis Gate Member, 217–221, 218
 boundary relations, 220
 characteristics, 220
 chemostratigraphy, 220
 generalized lithostratigraphy of Marmorata Terrane, 219
 geochronological constraints, 220

- glaciogenic deposits and associated strata, 219–220
 Bogenfels Formation, 220
 Chameis Gate Member, Dernburg Formation, 219
 palaeolatitude and palaeogeography, 220
 stratigraphy, 219
 structural framework and tectonic evolution, 217–219
 tectonic subdivision of Marmora Terrane in western Gariep Belt, 218
 Chameis Group, 217–221, 218
 Chameis Subterrane, 218
 Chang'an Formation, 359
 Chapada Acauá Formation, 528
 Chara River basin, 297–302
 boundary relations, 299–300
 chemostratigraphy, 300–301
 glaciogenic deposits and associated strata, 298–299
 palaeolatitude and palaeogeography, 301
 stratigraphy, 297–298
 Upper Precambrian diamictites of Central Siberia, 297–302
 chemical index of alteration (CIA), 81–90
 A–CN–K diagram, 85
 evidence of glaciomarine deposits, 86–89
 implications for study of Neoproterozoic climate change, 89
 Neoproterozoic glacial deposits and climate transitions, 81–90
 Oman Masirah Bay Formation, 89
 oxides in molecular ratios, 85
 provenance and reconstruction of original compositions, 84–86
 relationship between two weathering proxies, 82
 sampled formations and compositional groupings, 83
 values of Neoproterozoic Port Askaig Formation, 88
 weathering and weathering indices, 81–83
 weathering trends, 86
 whole-rock compositions and weathering indices, 87, 88
 Weathering Index of Parker (WIP), 83–84
 Yangjiaping section in South China, 84
 zirconium *v.* thorium diagram, 86
 chemical sediments, 67–74
 average thicknesses and idiosyncratic features, 70
 cap-carbonate sequences, 70–74
 barite in Marinoan-type (based Ediacaran) cap dolostones, 73–74
 distribution and thickness, 71
 early diagenetic barite in Taoudeni Basin, 74
 early diagenetic barite on Dzabkhan Platform, western Mongolia, 74
 early diagenetic barite on Yangtze Platform, South China, 74
 expanded and condensed sequences, 71
 giant wave ripples, 72
 highstand deposits of cap-carbonate sequences, 73
 Marinoan-type (basal Ediacaran) cap-carbonate sequences, 70–73
 Mid-Ediacaran cap carbonate sequences, 73
 phosphorites, 74
 primary and early diagenetic types of barite in cap dolostones, 73
 seafloor barite in central Australia, 73–74
 seafloor barite in northwestern Canada, 74
 seafloor carbonate cement, 72–73
 sheet-crack cements, 72
 Sturtian-type (Cryogenian) cap-carbonate sequences, 73
 transgressive cap dolostones in condensed sequences, 73
 transgressive cap dolostones in expanded sequences, 71–72
 tubestone (geoplumb) stromatolites, 72
 iron and manganese deposits, 67–70
 Central Flinders Ranges (Holowilena) and Nackara arc (Braemar), South Australia, 69
 distribution in time and space, 67–68
 geochemical characteristics, 69
 Jakkalsberg Member (Numees Formation, Port Nolloth Group), Gariep Belt, Namibia and South Africa, 69
 lithological associations, 68–69
 notable examples, 69
 Rapitan Group, northern Canadian Cordillera, 69
 genesis and significance of glacial-associated chemical sediments, 75–77
 abiotic or biogenic dolomite, 76
 accumulation rates for syndeglacial cap dolostones, 75
 barite in cap dolostones, 76–77
 cap-carbonate sequences, 75
 early diagenetic (void-filling) barite, 76–77
 ferrous *v.* euxinic anoxia, 75
 iron and manganese oxide deposits, 75
 localization of oxidative titration, 75
 non-marine syndeglacial cap dolostones, 75–76
 significance of seafloor aragonite cements, 76
 sources alkalinity for cap dolostones, 76
 subglacial sulphate-rich ferrous waters, 75
 chemostratigraphy, 51–62
 carbon isotopes, 52
 Ediacaran Period, 59–61
 iron speciation, 53
 pre-glacial Neoproterozoic, 53–57
 spanning Cryogenian glaciations, 57–59
 stratigraphic plots of carbon and sulphur trends, 59
 strontium isotopes, 53
 sulphur isotopes, 52–53
 summary of carbon and sulphur signatures, 56–57
 working chemostratigraphic compilations, 54
 China
 cratons, 101
 Chiquerio Formation, Peru, 481–486
 boundary relations, 484
 chemostratigraphy, 484
 economic deposits and biomarkers, 484
 geochronological constraints, 484–485
 glaciogenic deposits and associated strata, 482–484
 global correlation, 485–486
 laminated dolostone facies, 485
 location map and geological map of western coast, 482
 palaeolatitude and palaeogeography, 484
 stratigraphic section and carbon isotope trends, 483
 stratigraphy, 482
 structural framework, 482
 zircon probability density distribution diagrams, 485
 Chuos Formation
 boundary relations, 201
 glaciogenic and associated strata, 198
 Churochnaya Formation, 294
 boundary relations, 290
 chemostratigraphy, 290
 glaciogenic deposits and associated strata, 289–290
 climate physicists, 23
 Coal Creek inliers, 390
 Coates Lake group
 chemostratigraphy, 403–404
 stratigraphy, 400
 Congo. *See also* West Congo Supergroup
 palaeomagnetic constraints, 104
 Congo Craton, Central Africa, 185–192
 Cordillera Mackenzie Mountains, 397–409
 boundary relations, 403
 boundary relations Rapitan Group, 403
 boundary relations Stelfox Member, 403
 calcium isotope record of Stelfox glaciation, 408
 calcium isotopes, 404–405
 carbon isotope data from dolomite of Ravensthorpe Formation, 404
 carbon isotopes, 403
 characteristics, 406
 chemostratigraphy, 403–405
 composite columnar section of Neoproterozoic strata, 399
 correlation and palaeogeography, 408–409
 depositional strike of Neoproterozoic passive margin, 401
 geochronological constraints, 406
 giant wave ripples in Ravensthorpe Formation, 402
 glaciogenic and associated strata, 400–403
 iron isotopes cerium anomaly data, 405
 location map, 390
 lower Rapitan Group near Iron Creek, 399
 Neoproterozoic glacial record, 397–409
 origin and stratigraphic localization of basin-facies, 407
 origin of transitional-facies iron-formation, 407
 outcrop distribution, 398
 oxygen isotopes, 404, 404
 palaeoenvironmental interpretation, 407–408
 palaeoenvironmental interpretation of Rapitan Group, 406–407
 palaeolatitude and palaeogeography, 406
 palaeontology, 405–406
 Rapitan Group type section in Hayhook Lake area, 399
 stratigraphic nomenclature, 398
 stratigraphic relations, 401
 stratigraphy, 400
 structural framework, 398–400
 synglacial hematite jaspilite Rapitan Group, 405
 upper Sayunei and Shezal formations, 399
 Windermere Supergroup in Mackenzie Mountains, 398
 Corumbá Group, 495
 composite record of carbon and strontium isotopes, 494
 formations, 489
 glacially influenced sedimentation and carbonates, 487–496
 stratigraphy, 492
 Cotcase Creek Formation, 654–656, 656
 Cottons Breccia, 649–651
 Court Formation, 213–214
 Croles Hill Diamictite, 651–654
 boundary relations, 653
 glaciogenic deposits and associated strata, 653
 stratigraphy, 651–652
 structural framework, 651
 Cryogenian, 1–15, 145, 146
 composite stratigraphic log for Tarim Block, 375, 376
 Elatina glaciation, 718
 glacial erosional forms, 323
 glacial event, 489
 glacial ocean, 29
 glaciation and Northern Arabian–Nubian Shield, 277–283
 glaciogenic deposits of Marnya Formation, 317–327
 glaciogenic strata, 398
 Idaho and Utah, 425–433
 Brigham Group, 429
 characteristics, 430–431
 chemostratigraphy, 430
 depositional settings and climatic controls, 431–432

- Cryogenian (*Continued*)
 diamictite and volcanic succession, 428
 geochronological constraints, 431
 glaciogenic deposits and associated strata, 429
 map showing areas of outcrop, 426
 Neoproterozoic strata, 425–433
 palaeolatitude and palaeogeography, 431
 Pocatello area, 429
 Pocatello Formation and correlative units, 427–428
 regional correlations, 432–433
 rifting and glaciation, 425–433
 structural framework, 425–426
 tectonic setting, 432
 Uinta Mountain Group, 427
 Uinta Mountain Group and Big Cottonwood Formation, 427
 Utah and Idaho Neoproterozoic correlation chart, 426
 stratigraphy, 373, 426–429
 Yerelina Subgroup map, 714
- Cryogenian biostratigraphy of Australia, 113–130
Acaciella australica Stromatolite Assemblage, 122
 Australian Neoproterozoic stratigraphy and correlations, 116
Baicalia burra Stromatolite Assemblage, 123
 biostratigraphy, 118–125
Cerebrospira buickii from Spitsbergen, 119
 chemostratigraphy, 125–126
 distribution of *Acaciella australica* stromatolite, 114
 distribution of *Baicalia burra* stromatolite, 115
 distribution of Neoproterozoic basins, 114, 115
 geochronological constraints, 117–118
 global biostratigraphical correlation, 128
 global correlation, 126–129
 palynology, 118–121
 pre-Sturt glaciation stratigraphy of Australia, 124–125
 range chart of Neoproterozoic stromatolite distributions, 120
 stromatolite range chart, 121
 stromatolites, 121–125
 Sturt glaciation, 127
 taxonomic citations, 130
 filamentous microfossils, 130
 spheroidal microfossils and acritarchs, 130
 stromatolites, 130
- Cuiabá Group, 487–496
 boundary relations, 493
 characteristics, 494
 chemostratigraphy, 493–494
 composite record of carbon and strontium isotopes, 494
 glaciogenic deposits and associated strata, 492–493
 palaeolatitude and palaeogeography, 494
 schematic cross-section, 489
 structural framework, 489–490
- Dabbsjön–Långvattnet areas, 625
 Dahomeyide belt synthetic cross-section, 167
 Dalradian Supergroup, 18
 stratigraphic framework, 644
 Dalradian Supergroup, Scotland, 19, 643–644, 644, 646
 Damara foreland geological map, 212
 Datangpo Formation
 glaciogenic deposits and associated strata, 360
 interglacial depositional environment, 364
 isotope stratigraphy, 362
- Daugherty Gulch
 diamictite, 442
 volcanoclastic diamictite, 441
- David, Edgeworth, 21
 Death Valley region, 449–455, 459–464
 Kingston Peak Formation, 449–455, 459–464
 Delamerian Orogen subdivision, 704
 Denison Ranges lithofacies description, 708
 Dernburg Formation, 219
 detrital zircon, 246
 Dhofar, Oman, 239–247
 diamictite
 characteristics and origin, 42–43
 palaeoclimatic significance, 45–46
 Didikama Formation, 273
 discoidal impression, 168
 disrupted beds, 639
 Dom Feliciano Belt, 106
 geology, 549
 Dongqiaoenblaq Formation, 369
 Doornpoort, 213
 Dorchester Member, 477
 Doushantuo fauna, 146
 Doushantuo Formation, 101, 143
 isotope stratigraphy, 362
 Drook Formation
 Ediacaran biota, 472
 glaciogenic deposits and associated strata, 470
 stratigraphy, 469
 Duas Barras Formation, 527
 Duerdin Group, 670
 Dugub Formation, 267, 268
 Dutch Creek Formation, 416
 Duurwater trough and moraine, 199, 200–201
 Dzabkhan Platform, western Mongolia, 74, 343
 Dzabkhan terrane, 331
- Earth's time-averaged magnetic field, 98
 East-Central Namibia, 211–215
 Eastern Death Valley region, 449–455
 Eastern Officer Basin, 684
 Eastern Sadlerochit Mountains geological map, 382
 East Sayan Mountains, 285–288
 East Sayan Range, 101, 317–327
 Ediacaran
 ice-rafting in South Australia, 673–675
 palaeogeography in South Australia, 697
 Ediacaran Period
 acritarch successions, 121
 biota and Drook and Mistaken Point formations, 472
 cap carbonate sequences, 73
 composite stratigraphic log for Tarim Block, 375, 376
 geochronology dating Neoproterozoic, 144–145
 Kailaketik Group stratigraphy, 373
 Neoproterozoic chemostratigraphy, 59–61
 successions and chronometric constraints, 118
 sulphur-isotope record, 61
- Edwardsburg Formation
 boundary relations, 442
 glaciogenic deposits and associated strata, 441
 volcanic and diamictite rocks, 439
 Windermere Supergroup, Idaho, USA, 437–446
- Egan Formation, 662–666, 664
 boundary relations, 666
 depositional interpretation, 665–666
 palaeolatitude and palaeogeography, 666
 stratigraphy, 664–665
 structural framework, 663
- Egypt
 BIF, 281, 282
- Elatina Formation, 26, 113, 117, 684
 Elatina glaciation, South Australia, 713–719
 boundary relations, 717
 chemostratigraphy, 717
 deposits, 102
 geochronological constraints, 718
 glaciogenic deposits and associated strata, 714–717
 map, 714
 palaeolatitude and palaeogeography, 717–718
- stratigraphy, 713–714, 715
 structural framework, 713
 Eleonore Bay Supergroup, 586
 Engerdalen Basin composite section, 620
 Eritrea glaciogenic deposits, 267–268
 Eskadron glaciogenic deposits, 213
 Ethiopia
 Tambien Group, 102, 263–275
 Eurasia
 glaciogenic succession map, 4
 knowledge base, 12–14
 Neoproterozoic ice age data set, 5
 Europe
 glaciogenic succession map, 10
 knowledge base, 14
 Neoproterozoic ice age data set, 11
- Fadnuvag'gi Formation, Tanafjord, 595
 Fargoo Formation, 666–671
 boundary relations, 669
 chemostratigraphy, 669
 depositional interpretation, 668–669
 geochronological constraints, 669
 glaciogenic deposits, 668–669
 Kimberley Region, 666–671
 palaeolatitude and palaeogeography, 669
 stratigraphy, 667–668
 structural framework, 666–667
 Fedo potassium-metasomatic effect, 85
 Feforkampen outlier, 616
 Finnmark
 Mortensnes Formation, 593–600
 Nyborg Formation, 597, 599, 600
 Smalfjord Formation, 20, 593–600
- Fiq diamictite, 102
 Fiq Formation, 251–260. *See also* Abu Mahara Group, Jabal Akhdar, Oman
 depositional history, 255–256
 geochronological constraints, 258–260
 glaciogenic deposits and associated strata, 253–256
 potassium-metasomatism, 88
 repeated glacial advance and retreat, 260
 sedimentology, 254–256
 distal glaciomarine facies association, 255
 facies associations, 254–255
 glaciogenic deposits and associated strata, 254–255
 non-glacial sediment gravity flow facies, 255
 non-glacial shallow marine facies association, 255
 proximal glaciomarine facies association, 255
 stratigraphic height, 89
 structural framework, 252–253
 turbiditic sandstone, 259
 volcanoclastic Saqlah unit, 259
- Formiga area, 536–537
 Formiga outcrop, 537
 Fouroumbala Basin, 190
 Fourth Range geological map, 380
 Frank River Sandstone glaciogenic deposits, 668
 Franni-aus Member boundary relations, 201–202
 Fransfontein foreslope differentiation, 198
 Fransfontein Ridge, 197
 foreslope, 200
 Fulu Formation
 glaciogenic deposits and associated strata, 359–360
 isotope stratigraphy, 362
 Yangtze Region, China, 357–358
 Fungurume Group, 176
- Gabon Basin stratigraphy, 188
 Gairdner Dyke Swarm, 117
 Gaiassa Thrust Belt, 604
 Gärdssjön Formation, 626
 Gariiep belt, 104, 224
 Gariiepan stratigraphy, 225

- Garvellach Islands, 640
- Gaskiers
glacial event, 620
glaciation, 105
- Gaskiers Formation, Newfoundland, Canada, 467–473
boundary relations, 470
characteristics, 471
chemostratigraphy, 471
deep-marine glaciogenic, 467–472
general map of Avalon Peninsula, 468
geochronological constraints, 471
glaciogenic deposits and associated strata, 470
associated volcanic rocks, 470
Drook Formation, 470
Gaskiers Formation, 470
Mall Bay Formation, 470
outcrop map, 468
palaeolatitude and palaeogeography, 471
stratigraphy, 469–470, 469
structural framework, 467–469
- Gearbeljávri Formation, 607
geocentric-axial dipole (GAD), 98
geochronology. *See* Neoproterozoic geochronology
- geodynamic theories for Neoproterozoic glaciation, 26
- geomagnetic field, 106
- Ghaub Formation, 117
boundary relations, 201
Duurwater trough and moraine, 200–201
facies association, 200
facies associations and stratal architecture, 199–200
glaciation, 197
glaciogenic and associated strata, 199–201
palaeoenvironmental setting, 205
stratigraphy, 201
- Ghubrah Formation, 251–260. *See also* Abu Mahara Group, Jabal Akhdar, Oman
geochronological constraints, 258–260
glaciogenic deposits and associated strata, 253–256
palaeolatitude and palaeogeography, 258
structural framework, 252–253
- Gifberg Group, 233–237
areal distribution of individual formations, 235
boundary relations, 235
chemostratigraphy, 235–236
glaciogenic deposits and associated strata, 234–235
lithostratigraphy, 236
map showing location of Vredendal Outlier, 234
structural framework and tectonic evolution, 233–234
- glaciation at sea level, 24
glaciogenic sedimentary successions, 45
glaciomarine deposits, 24
chemical index of alteration, 86–89
glaciomarine successions, 40
- Gondwana distribution of cratonic blocks, 556
- Gospel Peaks, 437
- Grand Conglomerat Formation, Nguba Group, 176–177
facies, 177–179
- Grandfather Mountain Formation, 99
- Grasdalen Formation, Tanafjord, 594
- Great Breccia, 639
- greenhouse effect, 20
- Greenland
Neoproterozoic deposits, 581–590
- Gropbreen Member, 575
- Guozigou–Keguqingshan area
composite stratigraphic log, 375
geological map, 374
glaciogenic diamictites, 373–374
- Gwna Group, 105
- Hadash carbonate, 102, 256
- Hadash Formation summary log, 257
- Hallett Cove area, 716
- Hankalchough diamictite, 372–373
- Hankalchough Formation, 306
stratigraphy, 371
- Hank-Fersiga area stratigraphy, 165
- Harbour Main volcanic rocks, 468
- Hard Luck Creek, 391
- Harland, Brian, v. 1, 6, 14, 15, 17, 22–24, 93
- Hay Creek Group
diamictite, 395
glaciogenic deposits and associated strata, 391–392
- Hayhook Formation
post-glacial carbonate couplet, 402–403
stratigraphy, 400
strontium-rich aragonite and barite cements, 58
- Hedmark Basin, 617
- Hedmark Group
formations lithology, 617
rift basins, 620
- Hilda Subgroup, 228
- Hoggar, 104–105
- Holgat Formations, 227–228
- Hospers, Jan, 22
- Howchin, Walter, 21
- Huangyanggou Formation stratigraphy, 371
- Hula Hula diamictite, Arctic Alaska, 379–385
boundary relations, 383
chemo- and lithostratigraphy
Katakaturuk Dolomite, 381
Mt. Copleston, 383
Nularvik dolomite, 384
chemostratigraphy, 383–384
geochronological constraints, 384
geological map
Fourth Range, 380
Kikitak Mountains, 380, 382
Sadlerochit Mountains, 380, 382
Shublik Mountains, 380
glacial origin, 384
glaciogenic deposits and associated strata, 382–383
palaeolatitude and palaeogeography, 384
stratigraphy, 381–382
structural framework, 379–380
volcanic rocks, 383
- Huqf Supergroup, 251, 252
- Ice Brook Formation
glaciogenic and associated strata, 402
stratigraphy, 400
- Idaho
Cryogenian rifting and glaciation, 425–433
Edwardsburg Fm., central Idaho, 437–446
geological record, 444–446
Neoproterozoic correlation chart, 426
Neoproterozoic rocks in roof pendants, 439
Pocatello Fm., southeastern Idaho, 425–436
Windermere Supergroup, 437–446
- India, 347–353
- Infracambrian stratigraphic succession, 101
- Inindia beds, 685
- Inishowen Bed, 645–646
interbasinal correlations, 61
- Irecê Basin chemostratigraphy, 514
- Ireland, 643–647
boundary relations, 645–646
carbon isotope trends for Dalradian Supergroup, 646
chemostratigraphy, 646
economic deposits and biomarkers, 646
geochronological constraints, 646–647
Neoproterozoic glaciogenic deposits, 643–647
palaeolatitude and palaeogeography, 646
- iron and manganese deposits
Central Flinders Ranges and Nackara arc, 69
distribution in time and space, 67–68
glacial-associated chemical sediments, 75
Jakkalsberg Member and Gariep Belt, 69
lithological associations, 68–69
Neoproterozoic glaciation iron formation, 67–70, 68
Otavi carbonate platform and foreslope, 203
Rapitan Group, northern Canadian Cordillera, 69
- Iron Creek area, 401
- iron isotopes, 405
Hayhook Lake, 405
- iron speciation, 53
water column redox conditions, 62
working chemostratigraphic compilations, 54
- Islay anomaly, 56, 58
- Isochron techniques analytical methodologies, 139–140
- Itabaiana dome area stratigraphy, 515
- Itawa area, 178
- Ituri Group, 191
- Jabal Akhdar, Oman, 251–260
geological map, 253
- Jacadigo Group, 487–496
boundary relations, 493
chemostratigraphy, 493–494
composite record of carbon and strontium isotopes, 494
depositional settings, 494–495
geochronological constraints, 494
glaciogenic deposits and associated strata, 492–493
lithostratigraphy, 491
palaeolatitude and palaeogeography, 494
schematic cross-section, 489
stratigraphy, 490–493, 491
structural framework, 489–490
- Jacoca Formation, 513
- Jakkalsberg Member, 69
- Jämtland Supergroup stratigraphy, 625
- Jbéliat area, 166
- Jbéliat Group, 72
- Jequitáí Formation, southeastern Brazil, 541–545
boundary relations, 544
chemostratigraphy, 544
geochronological constraints, 544
geological map, 543
glaciogenic deposits and associated strata, 542–544
measured vertical sections, 543
mineralization and characteristics, 544
palaeolatitude and palaeogeography, 544
simplified geological map, 542
stratigraphy, 541–545
structural framework, 541–545
- Jerta Formation, 606
- Jiangkou glaciations, 364
depositional environment, 364
geochronological constraints, 363
Yangtze Region, China, 357
- Jiangkou Group, 357
boundary relations, 361
distribution, 360
- Julius River Member, 651–654, 653
boundary relations, 653
glaciogenic deposits and associated strata, 652–653
stratigraphy, 651–652
structural framework, 651
- Kaigas Formation, 223–230, 224
boundary relations, 228
characteristics, 229
chemostratigraphy, 228–229
diamictite sedimentary features, 229
dolostone, 226
geochronological constraints, 229

- Kaigas Formation (*Continued*)
 glaciogenic deposits and associates strata, 226–228
 holostatotype, 225
 lithostratigraphy, 225
 palaeolatitude and palaeogeography, 229
 Port Nolloth Zone within Gariep Belt, 224
 stratigraphy, 225–226
 structural framework and tectonic evolution, 223–226
- Kailaketik Group stratigraphy, 373
- Kalahari and environs, 103–104
- Kamtsas Formation, 213
- Karagassy Group, 319
- Karoetjes Kop Formation, 233–237
 boundary relations, 235
 characteristics, 236
 chemostratigraphy, 235–236
 depositional environment, 236
 generalized lithostratigraphy of Gifberg Group, 236
 geochronological constraints, 236
 glaciogenic deposits and associated strata, 234–235
 map showing location of Vredendal Outlier, 234
 palaeolatitude and palaeogeography, 236
 stratigraphy, 234
 structural framework and tectonic evolution, 233–234
- Katakaturuk Dolomite, Arctic Alaska, 379–385
 composite carbon chemo- and lithostratigraphy, 381
 glaciogenic deposits and associated strata, 382
 metamorphic grade, 380
 stratigraphy, 381
- Katanga Series, 21
- Katanga Supergroup, Central Africa, 173–182
 boundary relations, 180
 carbonate rocks, 180–181
 characteristics, 180–181
 chemostratigraphy, 180
 cross-section, 178
 distribution, 175
 economic deposits, 180–181
 geochronological constraints, 181
 glaciogenic deposits and associated strata, 176–180
 lithostratigraphic section, 177
 Lufilian arc in Pan-African orogenic belts system, 174
 Neoproterozoic glaciogenic diamictites, 173–182
 palaeolatitude and palaeogeography, 181
 regional geology of Lufilian belt, 174
 stratigraphy based on syntectonic conglomerate complexes, 175
 structural and stratigraphic framework, 173–176
- Kazakhstan, 303–306
- Keele formation stratigraphy, 400
- Keilberg Member
 boundary relations, 202
 cap dolostone, 71
- Keyindi Formation stratigraphy, 374
- Khesen Formation, 339, 344
 glaciogenic deposits and associates strata, 340
 Khubsugul Group, Northern Mongolia, 343
 stratigraphy, 343
- Khesen Gol, 344
- Khongoryn Member, 100
 diamictite, 335
 glaciogenic deposits and associated strata, 333
 stratigraphy, 335
- Khubsugul basin, 331
- Khubsugul Group, Northern Mongolia, 339–344
 boundary relations, 340–342
 chemostratigraphy, 342
 detailed stratigraphy of Khesen diamictite, 343
 detailed stratigraphy of Ongoluk diamictite, 343
 geochronological constraints, 342–343
 geology of western shores of Lake Khubsugul, 341
 glaciogenic deposits and associates strata, 340–342
 Khesen and Ongoluk Gols, 343
 palaeolatitude and palaeogeography, 342
 stratigraphy, 340, 342
 structural framework, 339–340
 tectonic map, 340
- Kikitak Mountains
 geological map, 380, 382
- Kimberley Region, Australia, 103, 659–671
 chemostratigraphy, 671
 Duerdin and Albert Edward Groups, 667
 Fargoo Formation and Moonlight Valley Formation, 666–669
 glaciogenic correlation, 671
 glaciogenic stratigraphy of lower Duerdin Group, 670
 Kuniandi Group and Landrigan Fm., 663
 Landrigan and Egan formations, Mount Ramsay area, 662–666
 Louisa Downs Group and Egan Fm., 664
 Mount House Group and Walsh Formation, 661
 Neoproterozoic glacial deposits, 659–671
 tectonic units, 660
 Walsh Formation, 659–662
 boundary relations, 662
 depositional interpretation, 662
 geochronological constraints, 662
 glaciogenic deposits and associated strata, 661–662
 palaeolatitude and palaeogeography, 662
 stratigraphy, 661
 structural framework, 661
- King Island, 656
 geochronological constraints, 651
 glaciogenic and associated strata, 650
 structural framework, 649–651
- Kingston Peak Formation, 449–455, 459–464. *See also* Panamint Range
 boundary relation, 453, 463
 carbon and oxygen isotopic values for carbonate, 453
 characteristics, 454, 463
 chemostratigraphy, 453–454, 463
 contact with overlying Noonday Dolomite, 453
 contact with underlying units, 453
 cross-section of four measured sections, 452
 eastern Death Valley region, 449–455
 Eastern Facies Assemblage stratigraphy, 451
 evidence for glaciation, 455
 facies, 459
 geochronological constraints, 454, 464
 glaciogenic deposits and associated strata, 451–453, 462–463
 glaciogenic deposits of Southern facies, 451–452
 map, 461
 map of facies assemblages, 450
 Noonday Dolomite, 459, 462–464
 northern facies, 451, 452
 palaeolatitude and palaeogeography, 454, 464
 Panamint Range, 459–464
 regional unconformity and diamictite deposition, 451
 stratigraphy, 450–451, 460–462
 structural framework, 449–450, 459–460
 Virgin Spring limestone, 453
- Komagfjord Antiformal Stack, 606
- Komagfjord Window, 609
- Koppang Formation, 613
 facies and stratigraphic context, 615
 outcrop area location for Neoproterozoic glacial, 614
 stratigraphy and sedimentology, 618
 structural setting, 615
- Koyva Formation, 294
 boundary relations, 292
 characteristics, 292
 chemostratigraphy, 292
 glaciogenic deposits and associated strata, 291–292
 stratigraphy, 294
- Koyva River stratigraphy, 294
- Krokvatn Diamictite, 599
- Krokvatn Palaeovalley
 glaciogenic deposits and associated strata, 595–596
 schematic profile, 596
- Kulutieliecti Formation
 glaciogenic diamictites, 374
 stratigraphy, 373
- Kundelungu Group, 179–181
- Kuokkel Windows, 604
- Kurtun Formation, 325
- Kuruktag Range, 306
- Kyrgyzstan, 303–306
- Kzisuhum Formation, 367
- Laksefjordvidda, 595–596
- Landrigan Formation, 662–666, 669
 biostratigraphy, 666
 boundary relations, 666
 chemostratigraphy, 666
 depositional interpretation, 665–666
 geochronological constraints, 666
 glaciogenic deposits, 665
 palaeolatitude and palaeogeography, 666
 stratigraphy, 664–665
 structural framework, 663
- Långmarkberg Formation, 625, 626–627, 627
 glaciogenic deposits and associated strata, 625–626
- Lapa Formation, 518
- Las Ventanas Formation, 555–563
 boundary relations, 561
 characteristics, 561
 chemostratigraphy, 561
 distribution of cratonic blocks of west Gondwana, 556
 geochronological constraints, 562
 geochronological data, 561
 geological map, 558
 glaciogenic deposits and associated strata, 560–561
 map of formations, 557
 palaeolatitude and palaeogeography, 561–562
 simplified stratigraphic column, 560
 stratigraphic column, 559
 stratigraphy, 556–560
 structural framework, 555–556
- Laurentia and environs, 98–100
- Leger Granite, 246
- Lena River, central Siberia, 309–315
- Lenda Formation, 188
- Lesser Himalaya, India, 347–353
- Lillevanet Member, 598
- Lillfjället Formation, southern Swedish Caledonides, 629–633
 boundary relationships, 631–632
 clastic wedges, 632
 geochronology, 632
 geological map of Stor-Lövsjön area, 631
 glaciogenic and associated deposits, 630–632
 glaciogenic origin, 633
 map of main outcrop area, 630
 palaeolatitudes, 632
 profile along northern hill side, 632
 stratigraphy, 629–630, 630, 631
 structural relationships, 629
- Limekiln Spring Member
 boundary relations, 463
 stratigraphy, 460–461
- Lindian Basin stratigraphy, 188–190

- Lindi Supergroup, 185–192
 Congo Craton, Central Africa, 185–192
 geological sketch map, 186
 palaeolatitude and palaeogeography, 191
 stratigraphy, 186–188, 188–190
 structural framework and basin setting, 185–186
- Little Burke Tillite, 686
- Little Dal Group
 chemostratigraphy, 403–404
 stratigraphy, 400
- Loch na Cille Boulder Bed, 100, 645–646
- Lokoma Group, 189
- Lossit Limestone
 glaciogenic deposits and associated strata, 637
- Louisa Downs Group, 664
- Lower Doushantuo Formation samples, 143
- Lower Krokvatn Diamictite, 599
- Lower Starve Pechi Subformation, 292
- Lower Vendian Bol'shoy Patom Formation, 314
- Lufilian arc, 174
- Lufilian belt, 176
 regional geology, 174
- Lupton Formation, 684
- Lyell, C., 20
- Lyell Land, 586, 587
- Lyndhurst Formation, 707
- Macaúbas Group, 523–531
 boundary relations, 529–530
 characteristics, 530
 chemostratigraphy, 530
 composite stratigraphic columns, 528
 diamictite formations, 523–531
 general stratigraphic scheme, 527
 geochronological constraints, 530
 glaciogenic deposits and associated strata, 528–529
 location in relation to São Francisco craton, 524
 map showing distribution of different formations, 526
 palaeolatitude and palaeogeography, 530
 simplified geological map, 525
 stratigraphy, 527
 structural framework, 524–527
- MacDonaldryggen Member, 574
- MacDuff Bed, 645–646
- Mackenzie Mountains Supergroup
 stratigraphy, 400
 strontium-isotope ratios, 60
- Maieberg anomaly, 56
- Maieberg Formation, 198, 202–205
- Mai Kenetal Synclinorium, 268
 composite chemostratigraphic reference section, 273
 Tambien Group, Northern Ethiopia (Tigre), 264
- Maikhan Ul Member, 100
 diamictite units, 335
 glaciogenic deposits and associated strata, 332–333
 stratigraphy, 334
- Makonga–Kibambale area, 179
- Maldonado Group, 555–563
 boundary relations, 561
 palaeolatitude and palaeogeography, 561–562
 radiometric ages, 563
 stratigraphy, 556–560
 structural framework, 555–556
- Mali Group, 165, 169
 depositional environments, 166
- Mall Bay Formation
 glaciogenic deposits and associated strata, 470
 stratigraphy, 469
- Marinoan age, 100
 cap-carbonate sequences, 70–73
 glaciations dating Neoproterozoic, 145
- Marmora Terrane, 217–221, 218, 218
 generalized lithostratigraphy, 219
- Marnya Formation, 101, 317–327
 boundary relations, 323–324
 chemostratigraphy, 324, 325
 Cryogenian glacial deposits, 317–327
 Cryogenian glacial erosional forms, 323
 depositional systems, 320
 geochronological constraints, 324
 glaciation, 327
 glaciogenic deposits, 321–323
 Late Neoproterozoic deposits, 326
 outcrop logs and field sketches, 322
 palaeolatitude and palaeogeography, 324
 Sayan region geological map, 318
 stratigraphy, 319–321, 320
 Uda Formation, 321
 structural elements and lithostratigraphy, 318
 structural framework, 317–319
- Masirah Bay Formation, 89
- Matão Formation, 527
- Matheos Formation, 267, 268
- Mawson, Douglas, 22
- Mawsonland, 102–103
 palaeoequators, 103
- mean annual air temperature (MAAT), 719
- Mechum River succession, 99
- Meltout tillite, 42
- Meritri Group metaconglomerate, E. Sudan
 boundary relations, 281
 geochronological constraints, 282
 glaciogenic deposits and associated strata, 280–281
- Miaba Group
 chemostratigraphy, 518
 glaciogenic deposits and associated strata, 513–514
 and Neoproterozoic successions, 509–519
- Middle Urals, 289–295
- Mid Ediacaran
 ice-rafting in South Australia, 673–675
 palaeogeography in South Australia, 697
- Mineral Fork Formation, 425–433
- Mirassol d'Oeste Formation, 492–493
- Mirbat Group, Dhofar, Oman, 239–247
 CIA and MIA, 245
- Misinchinka Group, 416
- Mistaken Point formation, 472
- Moelv Formation, 613, 615–619
 facies and stratigraphic context, 615
 Hedmark Basin, 617
 location of outcrop area, 614
 stratigraphy and sedimentology, 615–619
 structural setting, 613–615
 Valdres Basin, 617–618
- Moema laminites, 535–540
 boundary relations, 538
 characteristics, 538
 chemostratigraphy, 538
 geochronological constraints, 539
 geological map of São Francisco Basin, 536
 glaciogenic deposits and associated strata, 536–537
 Neoproterozoic glaciogenic unit, 535–540
 palaeolatitude and palaeogeography, 539
 partial diagram of Formiga outcrop, 537
 São Francisco Basin, Brazil, 535–540
 stratigraphy, 535–536, 537, 538
 structural framework, 535
- Mongolia
 global correlation, 129
 Khubsugul Group, 339–344
 Tsagaan Oloom Formation, 331–336, 343
- Monkman Pass area stratigraphic columns, 415
- Moonlight Valley Formation, 666–671
 boundary relations, 669
 depositional interpretation, 668–669
 glaciogenic deposits, 668–669
 palaeolatitude and palaeogeography, 669
 stratigraphy, 667–668
 structural framework, 666–667
- Moores Lake Formation, 442
- Moores Station Formation, 439
 glaciogenic deposits and associated strata, 441–442
- Mortensnes Formation, 593–600, 599
 boundary relations, 598
 chemostratigraphy, 598
 glaciogenic deposits and associated strata, 594–598, 597–598
 palaeolatitude and palaeogeography, 598
 stratigraphy, 594
 structural framework, 593–594
- Mount Copleston volcanic rocks stratigraphy, 381
- Mount Cornish Formation, 686
- Mount Davenport Diamictite Member, 268, 686
- Mount Doreen Formation, 686
- Mount House area, 661
- Mount House Group, 661
- Mount Lofty Ranges lithofacies description, 706
- Mount Nelson, 416
- Mount Ramsay area, 662–666, 664
 boundary relations, 666
 depositional interpretation, 665–666
 palaeolatitude and palaeogeography, 666
 stratigraphy, 664–665
 structural framework, 663
- Naburula Formation, 685
- Nackara Arc, South Australia
 glaciogenic deposits and associated strata, 715–716
 iron and manganese deposits, 69
 lithofacies description, 706
- Nafun Group, 258
- Nakfa terrane, 265
- Nama assemblage dating Neoproterozoic, 146
- Namibia
 Chameis Group, 217–221, 218
 global correlation, 129
 Kaigas and Numees Formations, 223–230
 Otavi Group, 195–206
 Port Nolloth Group, 223–230
 Witlev Group, 211–215
- Nanhuan system and period, 357
- Nanook Limestone
 composite carbon chemo- and lithostratigraphy, 381
 stratigraphy, 381–382
- Nantuo Formation, 314
 boundary relations, 361–362
 claystone, 719
 glaciations, 364
 glaciogenic deposits and associated strata, 360
 depositional environment, 364
 geochronological constraints, 363
- Negash Synclinorium
 composite chemostratigraphic reference section, 273
 Tambien Group, Northern Ethiopia (Tigre), 264, 268
- Neoproterozoic chemostratigraphy, 51–62
- Neoproterozoic geochronology, 138–140
 age of primary standards, 141
 analytical methodologies, 138–140
 isochron techniques, 139–140
 uranium lead methodologies, 138–139
 uranium lead microbeam techniques, 139
 calculating age from multiple dates, 142
 calibrating tracers for isotope-dilution, 141–142
 complex uranium lead zircon systematic, 142–144
 dating, 135–137, 144–147
 accessory minerals from volcanic rocks, 135–136
 Avalon assemblage, 146
 chemical precipitates and organic residues, 136
 Doushantuo fauna, 146
 earliest fossils, 146
 Ediacaran glaciations, 144–145

- Neoproterozoic geochronology (*Continued*)
 future directions, 146–147
 glacial intervals, 144–145
 Marinoan glaciations, 145
 maximum and minimum age constraints, 137
 Nama assemblage, 146
 Neoproterozoic events, 146
 Pre-Sturtian glaciations, 145
 Re–Os dating of organic-rich sediments, 136
 Shuram–Wonoka carbon isotope excursion, 146
 Sturtian glaciations, 145
 uranium lead dating of carbonate, 136
 uranium lead dating of phosphates, 136–137
 White Sea assemblage, 146
 decay constants, 141
 isochron diagram, 138
 linear arrays v. isochrons, 144
 microbeam uranium lead standardization, 140
 radio-isotopic dating techniques, 147
 radio-isotopic geochronometers, 137–138
 Uranium-lead, 137–138
 whole-rock geochronometers, 138
 radiometric decay systems used in geochronology, 136
 random/internal uncertainties, 140
 sources and types of uncertainty, 140–147
 subjective interpretation of dates, 147
 uncertainties from geologic complexity, 142–144
 uranium lead concordia diagram, 137, 138
 uranium lead zircon data, 143, 144
 lower Doushantuo Formation samples, 143
 Pocatello Formation samples, 144
 Scout Mountain Member samples, 144
 users guide, 135–147
 Neoproterozoic glacial palaeolatitudes, 93–107
 depositional palaeolatitudes for Neoproterozoic strata, 94–97
 global update, 93–107
 methods, 93–98
 palaeoequators plotted across Australia and Mawsonland, 103
 palaeoequators plotted across Laurentia, 99
 palaeomagnetic constraints, 98–106
 published assessment of glacial influences, 94–97
 reliability of palaeomagnetic depositional latitudes, 98
 Neoproterozoic glaciations
 chemical index of alteration, 81–90
 chemical sediments, 67–74
 chemostratigraphy, 51–57
 history of research, 17–29
 geochronology, 135–147
 Ediacaran glaciations, 144
 Marionian glaciations, 145
 Pre-Sturtian glaciation, 145
 Sturtian glaciation, 145
 iron formation, cap carbonate, barite and phosphorite, 67–77
 palaeolatitudes, 93–107
 Neoproterozoic glaciogenic successions, 39–47
 classification, 40
 diamictite units, characteristics, 42–43
 glacial environments characteristics, 39–45
 glacial influence recognition, 39–47
 glaciolacustrine and glaciomarine settings, 44–45
 glacial sedimentary indicators, 41
 historical development of terminology, 39
 palaeoclimatic significance
 clast characteristics, 46
 diamictite, 45–46
 oversized clasts in bedded sediments, 46
 stratigraphic trends and sequence boundaries, 46–47
 reconstructing palaeoenvironmental conditions, 45–47
 subglacial settings, 40–44
 terrestrial proglacial settings, 44
 Neoproterozoic ice ages, 1–16
 available datasets, Africa, 3
 available datasets, Australia, 13
 available datasets, Eurasia and Nubian Shield, 5
 available datasets, Europe, 11
 available datasets, North America, 7
 available datasets, South America, 9
 calibrating change, 15
 current knowledge base, 6–15
 Africa, 12
 Australia, 14
 Eurasia–Nubian Shield, 12
 Europe, 14
 North America, 14
 South America, 14
 glaciogenic succession, Africa, 2
 glaciogenic successions, Australia, 12
 glaciogenic successions, Eurasia and Nubian Shield, 4
 glaciogenic successions, Europe, 10
 glaciogenic successions, North America, 6
 glaciogenic successions, South America, 8
 Neoproterozoic research, glacial geology, 17–30
 1871–1908, pioneering discoveries, 17–21
 1909–1941, period of globalization, 21–22
 1942–1964, rebutting challenges, 22–23
 Newcastle and Köln palaeoclimate conferences, 22–23
 palaeomagnetism and meridional extent of ice sheets, 22
 1965–1981 in wake of plate tectonic revolution, 23–24
 associated chemical sediments banded iron- and manganese-formation and cap carbonates, 23
 climate models and white Earth instability, 23–24
 earth's Pre-Pleistocene Glacial Record volume, 24
 1982–1997, gathering storm, 24–28
 biocatalysed weathering, 28
 cap carbonates, 25–26
 carbonate burial, 26
 causative theories for glaciation, 26–28
 continental break-up, 28
 continental distribution, 27
 ice-ring collapses, 27
 impact ejecta, 27
 large orbital obliquity, 26–27
 ocean stagnation, 27–28
 bibliographic history of Pleistocene glacial controversy, 29
 bidirectional climate change, 20
 causative theories for glaciation, 26
 astronomical theories, 26
 first reported occurrences of glaciogenic deposits by palaeocontinent, 19
 glaciation papers growth in annual number, 18
 glaciogenic deposits, cumulative discovery by palaeocontinent, 18
 greenhouse effect, 20
 iconic sketch of glacially striated pavement beneath end-Cryogenian Smalfjord diamictite, 19
 idiosyncratic sedimentary and early diagenetic features in cap dolostones, 25
 long road to consensus, 28–30
 Pleistocene glacial controversy, 20
 Port Askaig Tillite discovery and historical scientific context, 18–21
 boulder beds, 18–19
 Ngalia Basin, 687
 glaciogenic deposits and associated strata, 685–686
 Nguba groups, 173
 Niari diamictites, 188
 Nichatka Formation, 297–302
 age, 301
 boundary relations, 299–300
 chemostratigraphy, 300–301
 geochronological constraints, 301
 geographical position, 298
 glaciogenic deposits and associated strata, 298–299
 palaeolatitude and palaeogeography, 301
 regional palaeogeography, 301–302
 sedimentary environments, 301
 stratigraphic position, 299
 stratigraphy, 297–298
 structural framework, 297
 type sections, 300
 Upper Precambrian diamictites of Central Siberia, 297–302
 Noonday Dolomite, 453
 carbonate platforms, 454
 map, 461
 stratigraphy, 451, 462
 Nordaustlandet, 576
 stratigraphic nomenclature and correlations, 573
 North America
 glaciogenic succession map, 6
 knowledge base, 14
 Neoproterozoic ice age data set, 7
 North American Cordillera correlations, 444
 Northern Arabian–Nubian Shield, 277–283
 Atud and Nuwaybah diamictite location, 280
 boundary relations, 281
 characteristics, 281–282
 chemostratigraphy, 281
 evidence for Early and Mid-Cryogenian glaciation, 277–283
 geochronological constraints, 282
 locality map showing geologic units, 278
 location of Neoproterozoic deposits of possible glacial origin, 278
 palaeolatitude and palaeogeography, 282
 possible glaciogenic deposits and associated strata, 280–282
 stratigraphic summaries of possibly glaciogenic Cryogenian units, 279
 stratigraphy, 278–280
 structural framework, 278
 Northern Paraguay Belt
 Puga Formation, 487–496
 Serra Azul Formation, 499–501
 North Flinders Zone
 glaciogenic deposits and associated strata, 714–715
 lithofacies description, 707–708
 North Urals, 289–295
 Norway. *See also* South Norway
 Baltoscandian craton and Hedmark and Valdres rift basins and Engerdalen Basin, 620
 Smalfjord and Mortensnes formations, Vestertana Group, E. Finnmark, 593–600
 Norwegian sparagmite basins, 100
 Nova Aurora Formation, 529
 Nubian Shield, 239, 251, 263–275, 277–283
 glaciogenic succession map, 4
 knowledge base, 12–14
 Neoproterozoic ice age data set, 5
 Nularvik dolomite
 chemo- and lithostratigraphy, 384
 crystal fans, 385
 glaciogenic deposits and associated strata, 382–383
 Numees Formations, 223–230
 boundary relations, 228
 chemostratigraphy, 228–229
 distinct carbonate unit, 227
 glaciogenic deposits and associated strata, 226–228, 227
 palaeolatitude and palaeogeography, 229
 radiometric age control, 230
 stratigraphy, 225–226
 structural framework and tectonic evolution, 223–226

- Nuwaybah Formation diamictite, NW Saudi Arabia
 geochronological constraints, 282
 Northern Arabian–Nubian Shield, 280
 possible glaciogenic deposits and associated strata, 281
- NW Tasmania, 651–654
 geochronological constraints, 654
 glaciogenic and associated strata, 652–653
- Nyanga-Niari Basin, 188
- Nyborg Formation, Finnmark, 599
 dolostones, 600
 glaciogenic deposits and associated strata, 597
- oceanographic theories for Neoproterozoic
 glaciation, 26
- ocean stagnation Neoproterozoic glacial geology,
 27–28
- Officer Basin, South Australia, 673–675, 688
 chemostratigraphy, 673–674
 geochronological constraints, 674
 glaciogenic deposits and associated strata, 673
 Mid-Ediacaran ice-rafting, 673–675
 palaeolatitude and palaeogeography, 674
 stratigraphy, 673
 structural framework, 704
- Old Fort Point (OFP) Formation
 boundary relations, 419
 glaciogenic deposits and associated strata, 418
 stratigraphic columns, 418
 Windermere Supergroup, southern Canadian
 Cordillera, 414–415, 420
- Olhos d'Água Formation, 514
- Olympic Formation, 685
- Oman Member Formation, 239–247, 251–260
 CIA, 89
 Neoproterozoic outcrops and salt basins, 252
- Ombaatjie Formation boundary relations, 202
- Ongoluk Diamictite
 glaciogenic deposits and associated strata,
 340–342
 stratigraphy, 343
- Ongoluk Formation, 343
- Ongoluk Gol stratigraphy, 343
- Oorabra, 686
- Oselok Group, 101, 317–327
 boundary relations, 323–324
 correlation of Late Neoproterozoic
 deposits, 326
 palaeolatitude and palaeogeography, 324
 stratigraphy, 319–321
 structural framework, 317–319
- Otavi carbonate platform and foreslope, northern
 Namibia, 195–206
 associated carbonates, 206
 boundary relations, 201–202
 chemostratigraphy, 202–204
 boron and calcium isotopes, 203
 carbon isotopes, 202–203
 oxygen isotopes, 203
 post-glacial negative anomalies, 202
 pre-glacial negative anomalies, 202
 reactive iron and manganese
 concentrations, 203
 strontium isotopes, 203
 sulphur isotopes, 203
 diagnostic glacial indicators, 204
 Duurwater trough and moraine, 200
 foreslope of Fransfontein Ridge, 200
 Fransfontein foreslope differentiation, 198
 geochronological constraints, 204
 geological map of Otavi Group fold
 belt, 196
 Ghaub Formation facies association, 200
 glaciogenic and associated strata, 195–206
 grounding-line oscillations, 206
 ice-rafted dropstones for maximum ice-shelf
 extent, 205–206
 magnitude of base-level and glacioeustatic
 changes, 206
- palaeoenvironmental setting of Ghaub
 Formation, 205
 palaeolatitudes and palaeogeography, 204
 role of rift faulting, 205
 stratigraphy, 196–197
 cross-section, 198
 crustal stretching and thermal subsidence,
 196–197
 Otavi Group subgroups, 196
 palaeogeography of platform and southern
 foreslope, 197
 relations in Abenab Subgroup and Ghaub
 Formation, 201
 restoration in north-south cross-section, 197
 structural framework, 195–196
- Otavi Mountains, 195
- oxygen isotopes
 current knowledge base, 6–14
- Pahrump Group, 432, 450, 459
- Palaeozoic succession in Greenland, 588
- Panamint Range, Death Valley, California,
 459–464. *See also* Kingston Peak Formation
 boundary relations
 Limekiln Spring/Surprise Members, 463
 overlying and underlying non-glacial units,
 463
 Wildrose sub-member, 463
 characteristics, 463
 chemostratigraphy, 463
 composite stratigraphic column of
 Neoproterozoic units in Death Valley
 region, 460
 geochronological constraints, 464
 glaciogenic and related strata of Neoproterozoic,
 459–464
 glaciogenic deposits and associated strata,
 462–463
 Kingston Peak Formation, 459–464
 map showing distribution, 461
 palaeolatitude and palaeogeography, 464
 stratigraphy, 460–462
 Limekiln Spring Member, 460–461
 Noonday Dolomite, 462
 Sourdough Member, 462
 South Park Member (exclusive of Wildrose
 Sub-member), 462
 Surprise Member, 461–462
 Wildrose sub-member of South
 Park Member, 462
 structural framework, 459–460
- pan-global infra-Cambrian glaciation, 577
- Paraguay Belt, Brazil, 487–496, 499–501. *See also*
 Puga Formation, Serra Azul Formation
- Patom region, 101
- Patom SGr in Ura Uplift succession, 311
- Peake Ranges lithofacies description, 708
- Penge Formation, 188
- Pepuerta Tillite dropstones, 718
- periglacial aeolianite, 717
- permafrost regolith, 717
- Perry Canyon, 428
- Pertatataka Formation age, 314
- Petit Conglomerat Formation
 clasts, 181
 glaciogenic deposits and associated strata,
 179–180
 petrographic studies, 180
 radiometric data, 181
- Petrovbreen Member
 characteristic stratigraphic sections, 575
 diamictite, 577
 glaciogenic deposits and associated strata,
 573–574
 phosphorite, 67–77
- Pickelhaube Formation, 227
- Pioneer Sandstone, 685
- Pirriyungka Formation, 684
- Playa Hermosa Formation, Uruguay, 547–552
 boundary relations, 550
 chemostratigraphy, 550
 comparative stratigraphic chart, 550
 Dom Feliciano Belt geology, 549
 geochronological constraints, 551
 glacially influenced environment, 551
 glaciogenic deposits and associated strata,
 548–550
 gravity-driven deposits, 552
 logged section, 550
 morphotectonic divisions, 548
 palaeogeographic reconstruction, 551
 palaeolatitude and palaeogeography, 550–551
 stratigraphy, 548
 structural framework, 547–548
- Playa Verde Basin, 547–552
 stratigraphic chart, 550
- Pleistocene glacial controversy
 bibliographic history, 29
 Neoproterozoic glacial
 geology, 20
- Pocatello area stratigraphy, 429
- Pocatello Formation, 425–433
 stratigraphy, 427–428, 429
 uranium lead zircon data, 144
- Pod'em Formation, 101
- Polarisbreen Group, Svalbard, 571–578
 biostratigraphy, 577
 chemostratigraphy, 576
 composite stratigraphic column, 574
 geochronological constraints, 577
 geological sketch map, 572
 glaciogenic deposits and associated strata,
 573–576
 palaeolatitude and palaeogeography, 576–577
 stratigraphic nomenclature and
 correlation, 573
 stratigraphic sections, 575
 stratigraphy, 573
 structural framework, 571–578
- Port Askaig Formation, 19, 635–640
 boundary relations, 638
 chemostratigraphy, 638
 CIA and WIP values, 88
 economic deposits and biomarkers, 638
 environmental conditions, 639
 geochronological constraints, 639
 glaciogenic deposits and associated strata,
 636–638
 outcrops map, 636
 palaeolatitude and palaeogeography,
 638–639
 potassium-metasomatism, 88
 stratigraphy, 636, 636, 637
 structural framework, 635–636
- Port Askaig Tillite
 centenary of Thomson's (1891) study of, 23
 discovery and historical scientific context,
 18–21
- Port Nolloth Group, 223–230
 lithostratigraphy, 225
- Port Nolloth Zone within Gariep Belt, 224
- potassium feldspar
 Chinese glacial and non-glacial
 deposits, 84
 sedimentary enrichment, 87
- potassium metasomatism, 85
 Port Askaig and Fiq formation, 88
- Precambrian diamictites of Central Siberia,
 297–302
- Proterozoic evaporites, 106
- Puga Formation, 487–496
 boundary relations, 493
 characteristics, 494
 chemostratigraphy, 493–494
 composite record of carbon and
 strontium, 494
 correlations and geotectonic
 evolution, 495–496
 geochronological constraints, 494
 geological map of Paraguay Belt, 488

- Puga Formation (*Continued*)
 glacially influenced sedimentation and carbonates, 487–496
 glaciogenic deposits and associated strata, 492–493
 lithostratigraphy of Jacadigo Group, 491
 Neoproterozoic lithostratigraphy nomenclature, **489, 490**
 Northern Paraguay Belt depositional settings, 494–495
 palaeolatitude and palaeogeography, 494
 radiometric constraints, 496
 schematic cross-section, 489
 Southern Paraguay Belt depositional settings, 495
 stratigraphic section and variations, 493
 stratigraphy, 490–492
 structural framework, 489–490
- Qakmaklik Group, 367
- Quruqtagh area
 geological map, 372
 glaciogenic diamictites, 370–373
 stratigraphic log, 373
 stratigraphy, 370–372
- Quruqtagh region, 101
- radiative energy-balance equations, 23
- Rainout deposits, **42**
- Rapitan Group
 boundary relations, 403
 Canadian Cordillera Mackenzie Mountains, 398, 399
 geochronological constraints, 406
 glaciogenic and associated strata, 400–402
 iron and manganese deposits, 69
 palaeolatitude and palaeogeography, 406
 palaeontology, 405–406
 section in Hayhook Lake area, 399
 stratigraphy, 393, 400
 synglacial hematite jaspilite, 405
 Tatonduk Inlier, Alaska-Yukon, 391
- rare-earth elements, 405
- Rasthof anomaly, **56**
- Ravensthorpe Formation
 carbon and oxygen isotope data from dolomite, 404
 giant wave ripples, 402
 glacial carbonate, 402–403
 stratigraphy, 400
- Red Pine Shale, 430
- Red Sea Hills, 274
- Re–Os
 dating organic residues, 136
 whole rock geochronometers, 138
- Re–Os ages, 136, 420, 517, 519, 654, 687, 710, 718
- Rhynie Sandstone, 119
- Rio de la Plata Craton
 morphotectonic divisions, 548
 Neoproterozoic palaeomagnetic poles, **567**
 palaeomagnetic constraints on Neoproterozoic glacial palaeolatitudes, 105–106, 561
 palaeomagnetic poles, 568
- Rio Peixe Bravo Formation, 527
- Risbäck Group
 glaciogenic deposits and associated strata, 626
 glaciogenic diamictite, 627
- Ritsemjaure Window, 607
- Roan Group, 173, 174
- Rosh Pinah Formation
 glaciogenic deposits and associated strata, 227
 volcanic lithotypes, 227
- Roxbury Conglomerate, 105
- Roxbury gravels, 478
- Russian Federation
 Bokson Group, 285–288
 Bol'shoi Patom Formation, 309–315
 Marnya Formation, 317–327
- Nichatka Formation, 297–302
- North and Middle Urals, 289–295
- Russøya Member, 573
- Sadlerochit Mountains geological map, 380, 382
- SAFFRAN quarry
 glaciogenic deposits and associated strata, 537
 stratigraphy, 538
- Salitre Formation, 506
- San Carlos Formation, 555–563
 boundary relations, 561
 chemostratigraphy, 561
 fossil content support, 562
 glaciogenic deposits and associated strata, 560–561
 palaeolatitude and palaeogeography, 561–562
 stratigraphy, 556–560
 structural framework, 555–556
 whole succession, 557
- Sansikwa Subgroup, 188
- São Francisco Basin, Brazil, 509–519, 524, 535–539, 541–545
 associated strata, 512–513
 basal glacial deposit, 518
 Brasilia Belt geological map, 513
 chemostratigraphy, 514–517
 correlations, **511, 516**
 geochronological constraints, 516–517
 geological map, 536
 glaciogenic deposits, 509–519
 lithostratigraphic and chemostratigraphic correlations, 516
 megasequences of Neoproterozoic successions, 511
 mineralization, 517
 Moema laminites, 535–540
 Neoproterozoic cover, 510
 Neoproterozoic successions, 509–519
 Olhos d'Água Formation, 514
 palaeomagnetic constraints, 104
 Sergipano Belt geological map, 515
 stratigraphy, 510–512
 carbonate platform megasequence (marine), 511
 dominant continental siliciclastic megasequence, 512
 glaciogenic megasequence, 510–511
 Itabaiana dome area, 515
 structural and geotectonic framework, 509–510
- Särvi nappe, 630
- Saudi Arabia, 282
- Sayan Mountains, 285–288, 317–327
- Sayan region, 318
- Sayunei Formation, 399
- Scandinavian Caledonides, 623–627
 boundary relations, 626–627
 chemostratigraphy, 627
 diamictite units older than Risbäck Group, 627
 geological map, 624
 glaciogenic deposits and associated strata, 625–626
 glaciogenic diamictite, 627
 glaciogenic lithologies map, 594
 Jämtland Supergroup stratigraphy, 625
 Långmarkberg Formation, 626–627, 627
 sections through Långmarkberg Fm., 625
 stratigraphy, 624–625
 structural framework, 623–624
- Schisto-Calcaire Group, 188
- Schwarzbach, Manfred, 22
- Scotland, 635–640, 643–647
 boundary relations, 645–646
 carbon isotope trends for Dalradian Supergroup, 646
 chemostratigraphy, 646
 CIA and WIP values, **88**
 economic deposits and biomarkers, 646
 geochronological constraints, 646–647
 geological map, 644
 geological map of Scottish–Irish Dalradian Highlands, 644
 glaciogenic deposits and associated strata, 644–645
 MacDuff, Inishowen and Loch na Cille Boulder Beds, 645–646
 palaeolatitude and palaeogeography, 646
 Port Askaig Formation, Dalradian Supergroup, 19, 635–640
 Stralinchy–Reelan formations and Cranford and Whiteness cap carbonates, 645
 stratigraphic framework of Dalradian Supergroup, 644
 stratigraphy, 644
 structural framework, 643–644
- Scottish–Irish Dalradian Highlands, 647
 geological map, 644
- Scout Mountain Member, 144, 428–429
- Sen Formation, 298
- Sergipano Fold Belt
 chemostratigraphy, 515–516
 geological map, 515
- Serra Azul Formation, Brazil, 499–501
 boundary relations, 500–501
 chemostratigraphy, 501
 geochronological constraints, 501
 geological maps, 500
 glaciogenic deposits and associated strata, 499–500
 stratigraphy, 499, 500
 structural framework, 499
- Serra da Bodoquena, 494
- Serra do Catuni Formation, 528
- Sheepbed formation stratigraphy, 400
- Sheldon, Richard P., 27
- Shezal Formation, 399
 diamictite, 402
- Shiqian Formation stratigraphy, 371
- Shiraro area, 264
- Shublik Mountains geological map, 380
- Shuram anomaly, 60, 258
- Shuram–Wonoka anomaly, **56**
 carbon isotope excursion dating Neoproterozoic, 146
- Siberia
 Bokson Group, 285–288
 Bol'shoi Patom Formation, 309–315
 Marnya Formation, 317–327
 Nichatka Formation, 297–302
 palaeomagnetic constraints, 100–101
- Siberian Craton, 101, 317–327
- Siberian Platform, 327
- Sierra del Volcán Formation
 logged section, 567
 outcrops, 566
- Silasia Formation BIF, NW Saudi Arabia
 boundary relations, 281
 geochronological constraints, 282
 glaciogenic deposits and associated strata, 281
- Sinian system and period, 8, 357
 sedimentary basins, 101
 Yangtze Region, China, 357
- Slangen Member, 574
- Smalfjord Formation, 20, 593–600
 boundary relations, 598
 characteristics, 598–599
 chemical index of alteration, 81–90
 chemostratigraphy, 598
 diamictite, 19
 geochronological constraints, 599
 glaciogenic deposits and associated strata, 594–598
 map showing glaciogenic lithologies, 594
 Marinoan-type cap dolostone, 608
 palaeolatitude and palaeogeography, 598
 schematic profile, 596
 stratigraphic profiles, 595

- stratigraphy, 594
 structural framework, 593–594
- Snowball Earth, 151–159
 aftermath, 157–158
 carbon dioxide consumption, 153
 climatic modelling argument, 156–157
 duration as function of carbon dioxide, 157
 geochemical modelling argument, 157
 hypothesis, 28, 151, 247
 ice and climate, 154–156
 clear equatorial thin-ice as solution for life, 154–155
 glacial deposits and continental ice behaviour, 155–156
 onset of snowball, ice-albedo instability, 154
 slushball theory, 154
 initiation, 151–154
 melting, 156, 158
 modelling, 151–159
 modelling studies of Neoproterozoic ice ages, 152
 onset, 158
 sea-ice thickness, 155
- Sourdough Member stratigraphy, 449, 455, 462
 chemostratigraphy, 453, 455
- South America
 glaciogenic succession map, 8
 knowledge base, 14
 Neoproterozoic ice age data set, 9
- Southern Georgina Basin
 glaciogenic deposits and associated strata, 686
 Oorabra, Sun Hill and Black Stump Arkose, 686
- Southern Mount Freeling syncline, 695
- Southern Paraguay Belt, 487–496
 chemostratigraphy, 494
 depositional settings, 495
 glaciogenic deposits and associated strata, 492–493
- Southern Tasmania, 654–656
 geochronological constraints, 656
 glaciogenic deposits and associated strata, 655
 structural framework, 654–655
- South Norway, 613–621, 615–619
 Baltoscandian ice sheet, 619
 chemostratigraphy, 618
 composite section across west, 620
 correlation and age, 619–620
 examples of facies and stratigraphic context, 615
 geochronological constraints, 619
 geological map of Sparagmite region, 614
 Hedmark, Valdres and Engerdalen basins, 618–619
 Koppang Formation, 618
 Moelv Formation, 615–619
 Neoproterozoic glaciation, 613–621
 outcrop area location, 614
 palaeogeographical reconstruction, 616
 palaeogeography, 618–619
 Pre-Caledonian position, 618–619
 structural framework, 613–615
- South Park Member, 450, 464
 stratigraphy, 462
- Southwestern Umberatana syncline, 694–695
- Sparagmite region geological map, 614
- Spiral Creek Formation, Tillite Group, 587
- Spitsbergen, 571–578, 573
- Squantum Member, 475–479
 glaciogenic deposits and associated strata, 477
- Stappogiedde Formation, 598
- Starye Pechi Formation stratigraphy, 295
- Starye Pechi Subformation, 292
- Stelfox Member, 403
 glaciogenic and associated strata, 402
- Storelv Formation, 581
 glaciogenic deposits and associated strata, 587
- Stor-Lövsjön
 diamictite, 633
 geological map, 631
 UNU, 633
- Støvf Janet Formation para-autochthonous deposits, 587
- Stralinych–Reelan formation, 645
- stromatolites, 25
 range chart, 121
 successions of Australia, 121–125
 taxonomic citations, 130
- strontium isotopes, 53
 current knowledge base, 6–14
 ratios, 55, 60
- Stuart Shelf
 glaciogenic deposits and associated strata, 716
 map, 714
- Stuart Shelf glaciogenic formations, 715
- Sturtian age
 cap-carbonate sequences, 73
 glacial and post-glacial assemblages, 121
 glacial succession in Australia, 701–710
 glaciations dating Neoproterozoic, 145
 glaciation stratigraphy of Australia, 124–125, 126
 lithostratigraphic units, 708
 rifting, 703–704
 Sturtian glaciogenic succession, 710
 successions of Australia, 127
- Sturt Tillite, 113
- subaqueous debris flows, 43
- Sub-Saharan Africa. *See also* Africa
 geological sketch map, 186
- Sudan
 Meritri Group, 280–282
- sulphur isotopes, 52–53
 current knowledge base, 6–14
 Ediacaran, 61
- Sun Hill Arkose, 686
- Supergroup in Mackenzie Mountains, 398
- Surprise Member, 449, 461–462
 boundary relations, 463
 glaciogenic deposits and associated strata, 462–463
 stratigraphy, 461–462
- Svalbard, 571–578
 archipelago, 571
 global correlation, 126–129
- Swartleikrans Bed of Buehrmann, 235
- Table Mountain Group, 88
- Talisayi Formation stratigraphy, 374
- Tambien Group, Northern Ethiopia, 102, 263–275
 boundary relations, 268
 chemostratigraphy, 268–270
 chemostratigraphy data sets, 269
 composite chemostratigraphic reference section, 272, 273
 diamictite member, 267
 Dugub Formation, 267, 268
 geochronological constraints, 271–272
 glacial influence on sedimentation, 274–275
 glaciogenic deposits and associated strata, 266–268
 glaciogenic deposits in Eritrea, 267–268
 global palaeogeographic reconstruction, 270
 key exposures, 264
 lithostratigraphic subdivision, 265
 magmatism, 272
 Mai Kenetal Synclinorium, 264, 268
 Matheos Formation Diamictite Member, 268
 Negash Synclinorium, 264, 268
 palaeoenvironmental changes, 272–274
 palaeolatitude and palaeogeography, 270–271
 Post-Tambien Group magmatism, 272
 Pre-Tambien Group magmatism, 271–272
 radiometric age constraints, 271
 Shiraro area, 264
 stratigraphy, 266
 structural framework, 264–266
 tectonic and palaeogeographic setting, 275
 timing of prospective glacial intervals, 274
- Upper Werri Slate, 266–267
- Tanafjord area, 597
- Tandilia System, Argentina, 565–569
 boundary relations, 567
 chemostratigraphy, 567
 geochronology, 568
 glaciogenic deposits and associated strata, 566
 integrated stratigraphy, 566
 Neoproterozoic palaeomagnetic poles for Rio de la Plata, 567
 palaeolatitude and palaeogeography, 567–568
 palaeomagnetic poles for Rio de la Plata, 568
 Sierra del Volcán Formation logged section, 567
 Sierra del Volcán Formation outcrops, 566
 stratigraphic chart, 550
 stratigraphy, 565–566
 structural framework, 565
- Tany Formation stratigraphy, 293
- Taoudeni Basin, Africa, 163–169
 boundary relations, 167–168
 characteristics, 168
 chemostratigraphy, 168
 early diagenetic barite, 74
 geochronological constraints, 168
 geological map, 164, 167
 glaciogenic deposits and associated strata, 166–167
 palaeolatitude and palaeogeography, 168
 phosphorite in cap-carbonate sequences, 74–75
 stratigraphy, 163–166
 structural framework and basin setting, 163
 synthetic cross-section, 167
- Tarim area composite stratigraphic log, 376
- Tarim Block, NW China, 367–377
 composite stratigraphic log
 Aksu-Wusi area, 371
 Guozigou-Keguqingshan area, 375
 Quruqtagh area, 373
 Tarim area, 376
 Tielikeli area, 369
 geochronological constraints on diamictites, 375–376
 geological map, 368
 Aksu-Wusi area, NW Tarim Basin, 370
 Guozigou-Keguqingshan area, 374
 Quruqtagh area, 372
 Tielikeli area, 368
 glaciogenic diamictites, 367–374
 description, 368–369, 369–370, 371–373, 374
 palaeolatitude data, 377
 palaeolatitudes and palaeogeography, 376–377
 stratigraphy, 373–374
- Tarqat Formation stratigraphy, 374
- Tasmania, 649–656
 bedrock geological map of Smithton Synclinorium, 652
 boundary relations, 653
 chemostratigraphy, 653
 Cotcase Creek Formation, 654–656
 Cotton Breccia, 649–651
 distribution of Proterozoic rocks and major tectonic elements, 650
 geochronological constraints, 654
 glaciogenic deposits and associated strata, 652–653
 Julius River Member and Croles Hill Diamictite, 651–654
 King Island, 649–651
 boundary relations, 651
 characteristics, 651
 chemostratigraphy, 651
 geochronological constraints, 651
 glaciogenic deposits and associated strata, 650
 palaeolatitude and palaeogeography, 651
 stratigraphy, 650
 structural framework, 649
 palaeolatitude and palaeogeography, 653–654
 Southern Tasmania, 654–656
 boundary relation, 655

- Tasmania (*Continued*)
 chemostratigraphy, 655
 geochronological constraints, 656
 glaciogenic deposits and associated strata, 655
 stratigraphy, 655
 structural framework, 654–655
 stratigraphy, 651–652
 structural framework, 651
 Wedge River beds, 654–656
- Tatonduk inlier, Alaska–Yukon border, 389–395
 boundary relations, 392–393
 chemo- and lithostratigraphy, 392
 chemostratigraphy, 393
 depositional setting, 394–395
 geochronological constraints, 393–394
 geological map of exposures, 391
 glaciogenic deposits and associated strata, 391–392
 location map, 390
 Neoproterozoic stratigraphy, 390, 394
 nomenclature chart, 390
 palaeolatitude and palaeogeography, 393
 regional correlations, 395
 stratigraphy, 390, 393
 structural framework, 389–390
- Tatonduk River geological map, 391
- Tayga Group, 309
- Tayshir Member, 335
- Téniagouri Group, 169
- Tereeken Formation
 glaciogenic diamictites, 372
 stratigraphy, 371
- Terra-Wasserburg plots of SHRIMP data, 443
- terrestrial debris flows, 43
- thermal-ionization mass spectrometry (TIMS), 117, 138
- Thomson, James, 18
- Tielikeli area
 composite stratigraphic log, 369
 geological map, 368
 glaciogenic diamictites, 367–369
 stratigraphy, 367–368
- Tillite Group, Greenland, 581–590
 boundaries relations, 588
 chemostratigraphy, 588
 depositional setting, 589
 detailed stratigraphic logs, 585
 geochronological constraints, 589
 glaciogenic deposits and associated strata, 586–587
 location map, 582
 Lower Palaeozoic succession, 588
 other characteristics, 588
 palaeogeographical setting, 590
 palaeolatitude and palaeogeography, 588–589
 sequence stratigraphy, 589
 stratigraphical nomenclature, 583
 stratigraphy, 583–586
 Andrée Land Group, 583–584
 associated para-autochthonous strata, 586
 Tillite Group, 584–586
 stratigraphy of uppermost Andrée Land Group, 584
 structural framework, 582–583
 timing of glaciation, 589–590
- Timan Basin, 593
- Toby Formation, 413, 417, 420
 boundary relations, 419
 glaciogenic deposits and associated strata, 416, 417
 stratigraphic columns, 417
- Tonian successions, 117
- Tossåsfjället Group stratigraphy, 630
- Trezoan anomaly, 56, 58
- Tsagaan Oloom Formation, southwestern Mongolia, 331–336, 343
 associated carbonate rocks, 333–334
- chemo- and lithostratigraphy of Dzabkhan basin, 333
- chemostratigraphy, 334
 geochronological constraints, 335
 glaciogenic deposits and associated strata, 332–334
 palaeolatitude and palaeogeography, 334–335
 stratigraphy, 332, 334, 335
 structural framework, 331–332
 tectonic map, 332
- Tulasu Formation stratigraphy, 373
- Turkey Hill Formation, 684
- Twitya Formation, 400
- Tyndall, John, 20
- Ubangi Supergroup, 185–192
 geological sketch map, 186
 palaeolatitude and palaeogeography, 191
 stratigraphy, 186–188, 188–190
 structural framework and basin setting, 185–186
- Uda Formation
 depositional system, 320
 stratigraphy, 320, 321
- Uinta Mountain Group stratigraphy, 427, 427
- Ulvesø Formation, 581
 glaciogenic deposits and associated strata, 587
- Ulyakha Member, 323
 tillite, 325
- Una Group, Bahia, Brazil, 503–507, 509–519
 boundary relations, 506–507
 chemostratigraphic correlations, 516
 chemostratigraphy, 507
 correlations, 511
 geochronological constraints, 507
 geological map showing Bebedouro Formation, 504
 glacial lithofacies associations, 506
 glaciogenic deposits and associated strata, 504–506, 512
 ice-contact glaciomarine system, 505
 lithostratigraphic correlations, 505, 516
 lithostratigraphic successions, 505
 mineralization, 507
 stratigraphic variation in carbonates, 506
 stratigraphy, 503–504
 structural framework, 503
- United States of America
 global correlation, 129
 Windermere Supergroup, 437–446
- Upper Chapada Acauá Formation, 528
- Upper group Tatonduk inlier in east-central Alaska, 392
- Urals, 289–295
 glaciogenic deposits and associated strata, 289–293
 late Mesoproterozoic to Neoproterozoic, 290
 North and Middle, 289–295
 palaeolatitudes and palaeogeography, 293
 possible correlations, 294
 regional palaeogeography, 294–295
 sedimentary environments, 293
 stratigraphy, 289, 291, 293, 294, 295
 structural framework, 289
- uranium lead
 dating of chemical precipitates, 136–137
 microbeam techniques, 139
 sources and types of uncertainties, 140–144
 U–Pb methodologies, 138
 U–Pb radio-isotopic geochronometers, 137
- Uruguay
 Las Ventanas and San Carlos formations, 555–563
 Playa Hermosa Formation, Playa Verde Basin, 547–552
- Utah
 Cryogenian glacial deposits, 425–433
 Neoproterozoic correlation chart, 426
 rifting and glaciation, 425–433
- Vakkejokk Breccia, 606
 tillite, 609
- Valdres Basin, 617–618
 composite section, 620
- Varangerfjord, 596
- Varangeristiden, 609
- Vaza Barris Group
 chemostratigraphy, 515–516, 518
 glaciogenic deposits and associated strata, 513–514
 Neoproterozoic successions, 509–519
- Vazante Group, 518
 chemostratigraphy, 514–515, 514, 517
 glaciogenic deposits and associated strata, 512–513
- Vendian Bol'shoy Patom Formation, 314
- Vendian glacials stratigraphy, 291
- Vestertana Group, 593–600
 boundary relations, 598
 glaciogenic deposits and associated strata, 594–598
 palaeolatitude and palaeogeography, 598
 stratigraphy, 594
 structural framework, 593–594
- Villa Monica formation diamictite, 566
- Vindelälven River, 626
- Virgin Spring limestone, northern facies, 453
- Volta Basin
 succession, 166
 synthetic cross-section, 167
- Vredfontein Formation, 226
- Vredendal Outlier map, 234
- Vreeland Formation, 413–414, 415, 417, 420
 boundary relations, 419
 glaciogenic deposits and associated strata, 417–418, 417
 stratigraphic columns, 417
- Wahlgu Formation, 684
- Walsh Formation, 659–662, 661, 669
- Walsh Tillite, 103
- Wanapi Dolomite Member, 686
- Warren Gorge, 716
- Weathering Index of Parker (WIP), 82
 CIA, 83–84
- Wedge River Beds, 654–656
- Wegener's theory of continental displacement, 19
- West Congo Belt (WCB), 185–192
 diamictites, 190–191
- West Congo Supergroup, 185–192
 chemostratigraphy, 191
 Congo Craton, Central Africa, 185–192
 correlations, 191–192
 geochronological constraints, 191
 glaciogenic character of diamictites, 190
 map of Neoproterozoic sedimentary basins, 186
 palaeolatitude and palaeogeography, 191
 stratigraphy, 186–190
 structural framework and basin setting, 185–186
- Western Officer Basin
 Boondawari Formation, 684
 glaciogenic deposits and associated strata, 684
- White Earth problem, 23
- White Sea assemblage, 146
- Widouw Formation glaciogenic deposits, 234
- Wildrose sub-member
 boundary relations, 463
 stratigraphy, 462
- Williams, George, 26
- Willis, Bailey, 21
- Wilsonbreen Formation
 characteristic stratigraphic sections, 575
 glaciogenic deposits and associated strata, 575–576
- Windermere Supergroup, Idaho, USA, 437–446
 boundary relations, 442

- broader implications of Idaho geological record, 444–446
- Canadian Cordillera Mackenzie Mountains, 398
- characteristics, 442
- chemostratigraphy, 442
- correlation chart, 445
- correlations along North American Cordillera, 444
- depositional setting, 443–444
- Edwardsburg Formation, 437–446
- geochronological constraints, 443, 444
- geological map, 439, 440
- glaciogenic deposits and associated strata, 441–442
- palaeolatitude and palaeogeography, 443
- related rocks, 437–446
- stratigraphy, 439–441
- structural framework, 438–439
- Terra-Wasserburg plots of SHRIMP data, 443
- Windermere Supergroup, southern Canadian Cordillera, 413–421
- boundary relations, 419
- characteristics, 419
- chemostratigraphy, 419
- comparative stratigraphic columns, 415
- correlatives, 397
- geochronological constraints, 420
- geological map showing outcrop distribution, 414
- glaciogenic deposits and associated strata, 416–419
- Old Fort Point (OFP) Formation, 414–415, 420
- palaeolatitude and palaeogeography, 419–429
- regional correlations, 421
- stratigraphy, 416
- structural framework and basin setting, 415–416
- Toby Formation, 413, 417, 420
- Vreeland Formation, 413–414, 417, 420
- Window Allochthon, 607
- Witvlei Group, 211–215
- boundary relations, 214
- chemostratigraphy, 214
- economic deposits, biomarkers, 214
- geochronological constraints, 214–215
- geological map of Damara foreland, 212
- glaciogenic deposits and associated strata, 213–214
- palaeolatitude and palaeogeography, 214
- stratigraphy, 212–213, 212
- structural framework, 211–212
- Wonnadinna Dolostone, 686
- Wushinanshan Group, 369
- Yalaguz Formation, 367
- Yangjiaping section in South China, 84
- Yangtze Platform, South China, 74
- Yangtze Region, China, 357–364
- BIF, 362
- biomarkers, 363
- boundary relations, 361–362
- cap carbonate, 362
- characteristics, 362–363
- comparison of glaciations, 364
- depleted mantle model age, 362
- depositional environment, 363–364
- distributions of Jiangkou Group, 360
- Fulu Formation, 357–358
- geochronological constraints, 363
- glaciogenic deposits and associated strata, 359–360
- isotope stratigraphy, 362
- Jiangkou Group and Jiangkou glaciation, 357
- manganese deposits, 363
- Nanhuan system and period, 357
- Neoproterozoic lithostratigraphy, 359
- outcrops of Neoproterozoic glacial deposits, 358
- palaeolatitude and palaeogeography, 363
- Sinian system and period, 357
- stratigraphic columns, 361
- stratigraphy, 358
- structural framework, 358
- Yardida Tillite, 686
- Yerelina Subgroup map, 714
- Yudnamutana Subgroup, South Australia, 701–710
- Delamerian Orogen subdivision, 704
- facies architecture and depositional environments, 709
- geochronology, 709–710
- glaciogenic deposits and associated strata, 704–708
- ironstone, 705
- isotope chemostratigraphy, 709
- lithofacies, 710
- lithofacies description, 704–705
- lithostratigraphic units, **703**
- lithostratigraphy of Yudnamutana Subgroup, **706**
- outcropping deposits, 702
- palaeolatitude and palaeogeography, 709
- stratigraphic and tectonic relationships, 708
- stratigraphy, 701–702
- stratigraphy and suggested correlations, 715
- structural framework, 702–704
- Yudnamutana Trough lithofacies description, 707–708
- Yukkengol Formation stratigraphy, 371
- Yukon Tatonduk inlier, 389–395
- Za'am Group diamictite, 281–282
- Zabit Formation, 288
- diamictites origin, 344
- Zambian Copperbelt, 178
- Zhamoketi Formation stratigraphy, 371
- Zhaobishan Formation stratigraphy, 370
- Zhuya Group, 309
- age, 314
- zircon, 135
- dating rocks, 135–147
- detrital zircons, 137