

## Index

- Acorn field 35
- Adda field 248, 265–7
- Ål Basin and Terrace 153
- Alba Sand Formation 131
- Alpine inversion 33
- Amethyst field 10
- ammonite zones 77
- amplitude extraction 232–4
- Andrew Formation 54–5, 131, 292
- Andrew Sequence 131
- Angus Embayment 153
- Angus field
  - drilling history 154–9
  - geological setting 151–3
  - gross pay 182–3
  - structure 159–67
- Angus sands
  - depositional modelling 175–82
  - facies analysis 168–75
- anhydrite 39–41
- apatite FTA 3–5, 8
  - Cleveland Basin study 19–20
  - East Midlands Shelf case study 9–10
    - combined VR data 14–17
    - measurements 11–14
  - North Sea Basin study 17–19
- Apley well 12
- Arbroath field
  - exploration history 283–5
  - sedimentology 291–4
- Argyll Embayment 153
- Argyll field 32
- Auk field 32
- Auk Shelf 33
- authigenic minerals
  - calcite 209–11, 215, 219, 302
  - clays 211–13, 215, 219
  - quartz 213–15, 219
- Balder Formation 58, 131, 142, 143, 292, 297
- Beaully Formation 131
- Beechnut field 35
- Beinn–East Miller Shelf 68, 69, 76, 78, 92
- biostratigraphy 76–9, 102–3
- Biscathorpe well 12, 14–17
- Bosun Trend 187
- Bouma cycles 194
- Brae Formation 66, 100
- Brent Group 74
- Broom Formation 101
- Buchan Ridge 32
- bulk density measurements
  - Angus field 156, 157
  - Kilda field 191
- burial
  - estimates of 22–3
  - heat flow effects 8–9
- calcite cement 209–11, 215, 219, 302
- cap rocks 57–8
  - Nelson field 297
  - Scapa field 231
  - Viking Graben 101
- cementation
  - calcite 209–11, 215, 219, 302
  - clays 211–13, 215, 219
  - quartz 213–15, 219
- Cengio 231, 232
- Central Graben (Danish Sector)
  - chalk play studies 267–9
  - exploration history 247–50
  - field history 253–67
  - geological setting 250–3
- Central Graben (UK Sector) 31–2
  - sedimentary history
    - Tertiary 54–7, 291–4
    - Cretaceous 50–3
    - Jurassic 44–50
    - Triassic
      - basin evolution 35–7
      - facies analysis 41–3
      - halokinesis 37–41
      - sedimentology 43–4
  - Permian 32–5
- water-depth history
  - modelling methods 113–15

- results 115–19
  - sources of error 119–23
- Chalk Group 154, 258, 297
- chalk plays 53, 247, 253–60, 267–9
  - problems of development 269–78
- Chalk Sequence 131
- chlorite 44, 211–13
- chromostratigraphy 43
- clay minerals 211–13, 215, 219
- Cleethorpes well 12, 14–17
- Cleveland Basin
  - apatite FTA studies 19–20
  - maturity estimates 23
  - uplift studies 10
- Cloughton well 20
- Clyde Terrace 44, 45
- Cod field 57
- Cretaceous stratigraphy
  - Central Graben 50–3, 251
  - Witch Ground Graben 187, 188, 224, 228
- Cromer Knoll Group 154, 189
  
- Dagmar field 254–5
- Dan field 248, 255–9, 268
- debris flow
  - process 193
  - sediment associations 208, 302
- delta environments 80–3
- Denmark
  - chalk plays 267–9
  - fields developed 253–67
  - future exploration 269–78
  - oil production summary 247
- density inversion, salt-driven 37
- density measurements
  - Angus field 156, 157
  - Kilda field 191
- Derbyshire Dome 22
- Devonian 231, 232
- diagenesis
  - calcite 209–11, 215, 219, 302
  - clays 211–13, 215, 219
  - quartz 213–15, 219
- diapirs 52, 53
  - trap formation 57
  - turbidite interaction 55–7
- dinocyst zones 77
- dipmeter logs 146–7
  - doggers 209, 215, 219
- dome play structures 57, 254–5
- Dornoch Formation 131
- Draupne Formation 74
- Dunlin Group 73
  
- East Midlands Shelf
  - apatite FTA study 11–14
  - geological setting 4, 9–10
  - inversion 10–11
  - uplift and erosion estimates 22–3
  - vitrinite reflectance study 14–17
- East Shetland Basin 27, 67
- Eastern Trough 32, 39, 46, 48, 51–2, 53–4, 57, 58
- Ekofisk Formation 53, 131, 154, 292, 297
- Eocene
  - reservoir rocks 129
  - stratigraphy 131
  - water depth estimates 119
- Etive Formation 73, 74
  
- facies analysis
  - Angus sands 168–75
  - Kopervik sands 197–208, 216–19
- Faeroe Trough 67
- fan models 144, 293
- feldspar cement 211
- fill points, significance of 27
- Fisher Bank Basin 188
- fission track analysis (apatite) 3–5, 8
  - Cleveland Basin study 19–20
  - East Midlands Shelf study 9–10
    - combined VR data 14–17
    - measurements 11–14
  - North Sea Basin study 17–19
- Fjerritslev Formation 44
- Fladen Ground Spur 32, 67, 92, 93, 188
- Fladen Group 68, 72
- flow stripping 56
- fluidization 194
- fluvial environment characters 79
- foraminifera 76
- Forth Approaches Basin 32, 44, 67
- Forties Formation
  - depositional history 56–7, 291, 293, 296, 297
  - reservoir-play development 129, 136, 145,

- 283, 284, 287, 299–302  
 stratigraphic setting 131, 142, 143, 292
- Forties-Montrose Ridge 32, 44, 284
- Forties Sequence 131
- Frigg/Tay Sequence 131
- Fulmar Formation 47, 48–50, 287
- Fulmar Terrace 44, 45, 47
- gamma ray logs  
 Angus sand 156, 157  
 Kilda field 191  
 Montrose High 292  
 Scapa field 224  
 Viking Graben 81, 84, 85
- Gannet fields 133, 134
- Gardenstown 231, 233
- gas, phase reversal effects of 274–8
- Gassum Formation 43
- geochemistry and reservoir variations 27–8, 139
- geothermal gradient analysis 5–9
- glauconite authigenesis 209
- Gorm field 261
- grain flows 193
- gravity flow studies 192–7, 299
- Grensen Nose 151, 153
- Grove well 12, 14–17
- Gudrun sub-basin 69, 92
- Gudrun Terrace 69, 72
- Guillemot D field  
 core palynology 146  
 core radiography 147  
 depositional modelling 140–5  
 development 136–9  
 exploration history 129–30, 132–4  
 migration modelling 140  
 seismic section 135  
 stratigraphy 131
- gypsum 39–41
- Haisborough Group 154
- Halibut Horst 188, 223, 296
- Halibut Shelf 223, 224
- halokinesis 59, 69, 254–60  
 field effects  
 dome fields 254–5  
 swell fields 255–60  
 stratigraphic effects
- Palaeocene 57–8
- Jurassic 44–5, 47–50
- Triassic 37–41
- Haugersund Formation 45
- heat flow  
 links with burial 8–9  
 links with thermal gradient 5–6
- Heather Formation 66, 72, 73, 74, 79, 81
- Heno Plateau 248
- Hidra Formation 189
- Hod Formation 53
- Horda Formation 131
- Horda Platform 67
- Hordaland Group 292
- Horn Graben 249
- Hugin Formation 65, 66, 72, 73, 74, 79, 81, 84
- Humber Group 72, 154
- illite 215
- Inge High 153
- inversion  
 measurement 10–11  
 salt-driven 37
- Jaeren High 32, 33, 44, 47
- Joanne field 35
- Josephine field 35
- Judy field 35
- Jurassic  
 palaeogeography 90, 96, 97  
 stratigraphy  
 Central Graben 44–50, 251  
 Viking Graben 68–75, 79–86  
 tectonics 33, 109  
 volcanism 66
- kaolinite 211–13
- Kilda field 220  
 exploration history 187–8  
 geological setting 188–91
- Kimmeridge Clay Formation 57, 74, 79, 81, 84, 153, 154
- Kittiwake field 35
- Kopervik sand  
 depositional studies 192–7, 219–20  
 diagenesis 208–16, 219  
 discovery 187–8

- facies descriptions 216–19
  - debris flow 208
  - liquefied sand 205–8
  - turbidite 197–205
- geological setting 188–91
- Kraka field 248, 255, 259–60, 269
  
- Lapworth field 187
- Lindesnes Ridge 153
- Ling Formation 74–5, 85, 100, 101
- Ling Graben 32, 69
- Ling High 78, 93
- liquefaction
  - process 193
  - sediment associations 205–8
- Lista Formation 131, 142, 143
- Lola Formation 45
- Lomond field 57
  
- Mads High 248
- Marnock field 35, 38, 44
- Marnock Sandstone Formation 43
- maturity estimation 22–3
- Maurene Formation 54–5, 131, 142, 143, 292
- Mid–North Sea High 33, 151, 152
- Miocene
  - turbidite section 231, 232
  - water depth estimates 120
- miospores 76
- Montrose field
  - exploration history 283–5
  - sediment studies 291–4
- Montrose Group 291, 292, 296
  
- Nelson field
  - exploration history 283
  - geological setting 294
  - reservoir evaluation 299–302
  - stratigraphy 296–7
  - structure 297–8
- Ness Formation 73, 74
- neutron porosity 156, 157, 158
- Nils field 254–5
- Nordland Group 292
- North Sea
  - central
    - stratigraphy 131
    - structure 130
  - subsidence history 109–13
  - southern 17–19
  - western 10–11
  - see also* Central Graben; Viking Graben; Witch Ground Graben
- Northern Permian Basin 32, 33–4
  
- oil stain 27
- Oligocene water-depth estimates 120
- ostracods 76
- Outer Rough Basin 153
  
- Palaeocene
  - reservoirs 129, 283, 284, 291, 297
  - stratigraphy 53–7, 131, 292
  - water–depth estimates 118
- Palaeogene 107
  - subsidence history 109–13
  - water–depth modelling 108–9
    - method 113–15
    - results 115–19
    - sources of error 119–23
- palaeogeography 90, 96, 97
- palaeogeothermal gradient 5–9
- palaeotemperature analysis 3–5
  - apatite FTA 11–14
  - vitrinite reflectance 14–17
- palynology 146
- Pennine Axis 22
- Pentland Formation 45, 68
- permeability 156, 157, 158
- Permian Basins (North and South) 32, 33–5
- Permian stratigraphy 32–5
- phase reversal 274–8
- Pliocene water depth estimates 121
- pod subsidence 37–41
- porosity
  - Angus field 156, 157, 158
  - Kopervik sands 209–13
- Puffin High 130
- pyrite authigenesis 209, 211
  
- quartz authigenesis 213–15, 219
  
- radiography 147
- raft formation 57
- Ran sandstone 187
- Rannoch Formation 73, 74

- Rattray Formation 45, 68, 73, 88, 296
- Renee Ridge 188
- reserve estimates 147
- reservoirs
- development
    - chalk 267
    - Nelson field 299–302
    - Viking Graben 100–1
  - geometry 144, 145
- resistivity
- Angus field 156, 157
  - Scapa field 224
- reverse modelling 108
- rift cycles 32
- Jurassic–Tertiary 45–57
  - Triassic–Jurassic 35–45
  - Permian 32–5
- Ringkøbing High 152, 249, 251
- Roar field 261–5
- Rodby Formation 189
- Rogaland Formation 129, 131, 131–7, 142, 143, 145
- Rogaland Group 131, 292, 297
- Rolf field 254–5
- Rotleigendes Formation 34
- Rotleigendes Group 66
- Rufford well 12, 14–17
- salt deposition 35
- salt-related tectonics 59, 69
- field effects
    - dome fields 254–5
    - swell fields 255–60
  - stratigraphic effects
    - Jurassic 44–5, 47–50
    - Triassic 37–41
- Scapa field
- appraisal 222–3
  - development 225–6
  - geological setting 221
  - reservoir properties
    - characteristics 232–9
    - distribution 239–45
  - seismic data 230
  - stratigraphy 222
  - structure 226–8, 231
  - trap elements 231
- Scapa sandstone 222, 242–3
- Scoter field 57
- seal rocks 57–8
- Nelson field 297
  - Scapa field 231
  - Viking Graben 101
- seismic lines
- Angus field 162–5
  - Central Graben 252, 264
  - Eastern Trough 39, 46, 52
  - Guillemot D field 135
  - Marnock field 38
  - Nelson field 288, 295
  - Scapa field 230
  - Viking Graben 70, 71
- Sele Formation 58, 131, 142, 143, 292, 297
- sequence stratigraphy
- Central Graben 31–2
  - Central North Sea 131
  - Viking Graben 86–99
- shelf environments 83–4
- Shirley discovery 187
- shoreface environments 83
- siderite 44
- Skagerrak Formation 43, 66
- Skjold field 254–5
- Skua field 35
- Sleipner Formation 66, 72, 73, 74, 79, 81, 84
- Sleipner Terrace 68, 69, 72, 78, 93
- slides 193
- slumps 193
- smectite 215
- Smith Bank Formation 41, 66, 151, 154
- Sola Formation 189–91
- Sole Pit Basin 4, 10
- sonic logs
- Angus sand 156, 157, 158
  - Montrose High 292
  - Scapa field 224
  - Viking Graben 81, 84, 85
- sonic velocity and uplift estimates 20–1
- source rocks 101
- identification 27
  - maturity estimates 23
- South Brae sub-basin 68, 69, 92, 100, 101
- South Halibut Trough 32
- South Viking Graben *see* Viking Graben
- Southern Permian Basin 33
- Stainton well 12

- Staffjord Formation 73  
 subsidence modelling 108–9  
     Central North Sea 109–13  
 swell fields 255–60
- Tail End Graben 248, 251
- Tarbert Formation 65, 73, 74
- Tay Formation 129, 131, 136–7, 142, 143, 145, 146
- tectonics  
     Central Graben 33  
     subsidence modelling 108–9  
     Central North Sea 109–13
- Teichichnus* 172
- Tertiary  
     reservoir rocks 129, 283, 284, 291, 297  
     stratigraphy 53–7, 131, 251–3  
     uplift estimates 22–3  
     water–depth estimates 118–21
- Thelma Terrace 68, 69, 93
- thermal gradient  
     East Midlands Shelf study 11, 13  
     principles of measurement 6–8  
     problems of recording 5–6
- thermal history interpretation 3–5  
     East Midlands Shelf study  
         apatite FTA 11–14  
         vitrinite reflectance 14–17
- Tiffany sub-basin 69, 78, 93
- Tor Formation 53, 131, 154, 297
- trap formation  
     chalk effects 267–9  
     diapir effects 57
- Triassic sediments  
     basin evolution 35–7  
     facies analysis 41–3  
     halokinesis 37–41  
     sedimentology 43–4
- turbidity flow and turbidites 85–6, 231, 232, 293, 299–301  
     process 194–7  
     salt dome interaction 55–7  
     sediment associations  
         high density 197–201  
         laminated sand 201–3  
         low density 205  
         marginal sand 203–5
- Tyra field 248, 261–5, 269
- uplift  
     East Midland Shelf study 11, 13, 22–3  
     estimation  
         apatite FTA and VR data 8–9  
         sonic velocity data 20–2
- Utsira High 32, 67
- Valhall Formation 153, 154, 189–91, 222
- Variscan inversion 33
- Vestland Group 72
- Viking Graben (South)  
     biostratigraphy 76–9  
     depositional environments  
         delta 80–3  
         fluvial 79  
         marine 84–5  
         shelf 83–4  
         shoreface 83  
         turbidite 85–6  
     geological setting 66–7  
     sequence stratigraphy 86–99  
     stratigraphy 45, 68–75  
     structure 68
- Viking Group 72
- Violin Breccia 226
- vitrinite reflectance (VR) 3, 8  
     Cleveland Basin study 19–20  
     East Midlands Shelf study 14–17  
     southern North Sea study 17–19
- volcanism  
     Jurassic 66  
     Permian 34
- water–depth modelling 108–9  
     Central Graben case study  
         method 113–15  
         results 115–19  
         sources of error 119–23
- Welton well 12
- Witch Ground Graben 32, 67, 188, 189, 221, 222
- work stations 272
- Zechstein Group 66  
 Zechstein transgression 35