

Index

Page numbers in *italic*, refer to figures and those in **bold** refer to entries in tables.

- 34°S volcano *101*, **102**
 - Aleutian intra-oceanic subduction system
 - characteristics **4**
 - location **3**
 - Amami Plateau *165*
 - Andaman Sea *208*
 - andesite **61**
 - calc-alkalic andesite **61–63**, *62*
 - compared to continental crust **68–69**, *68*
 - magma type spatial variations **63**, *66*
 - magma mixing **63–67**
 - major and trace element characteristics **65**
 - Agog Shima *189*, *190*
 - Aoso volcano *223*, *226*
 - Arafura Shelf *208*
 - arc accretion in Taiwan and Ireland **83–85**
 - arc magmatism, general characteristics **56–57**
 - geochemical modelling **59**
 - incompatible element chemistry **58–61**
 - volcano distribution **57–58**, *57*
 - arc–continent collision model **81**, *94–95*
 - active continental margins **81–82**
 - arc accretion in Taiwan and Ireland **83–85**
 - arc crustal composition **82**
 - birth of active continental margins **82–83**
 - comparison of Mayo–Connemara with Taiwan
 - collisional orogenies **93**
 - continuous arc accretion **93–94**, *94*
 - lower crustal–mantle tectonics **88–89**
 - lower crustal delamination **89**
 - lower crustal subduction **89–90**
 - strength of collisional arc lithosphere *90*
 - magmatic evolution **87–88**
 - orogenic exhumation **85–86**
 - post-orogenic basin formation **90–91**
 - sedimentary response to arc collision **86–87**
 - significance of collision **82**
 - subduction polarity reversal **91–93**, *92*
 - Asakusa volcano *223*
 - Australian Plate *26*, *166*
 - Ayu Trough *208*, *209*
 - Bacan *209*
 - back arc basins (BAB) **120–121**
 - back-arc crustal accretion **19–20**, *45–46*
 - Lau Basin
 - axial depths *27*
 - bathymetry *27*
 - geochemical characteristics **29–30**
 - geophysical characteristics **28–29**
 - lava geochemistry **22**, *25*
 - spreading centres *27*
 - tectonic setting **21–28**, *26*
 - magmatic phases
 - diminished **44–45**
 - enhanced **42–43**
 - normal **45**
 - Manus Basin
 - axial depths *32*
 - bathymetry *32*
 - geochemical characteristics **33–34**
 - geophysical characteristics **32–33**
 - lava geochemistry **23**, *25*
 - opening rate *32*
 - tectonic setting **30–32**, *31*
 - Mariana Trough
 - axial depth profile *36*
 - bathymetry *36*
 - geochemical characteristics **38–39**
 - geophysical characteristics **37–38**
 - lava geochemistry **24**, *25*
 - tectonic setting **34–38**, *35*
 - model development **39–42**, *40*
 - study methods **20–21**
 - back-arc spreading **6**
 - Banda Sea *208*
 - Banggai Islands *209*
 - Batanta *209*
 - Bellingshausen Island *286*, *287*, *287*
 - geochemical variations and volcano histories **294–295**
 - major and trace element composition **290–292**
 - new isotope analyses **293**
 - Benham Plateau *165*
 - Bird's Head *209*
 - Bismark Sea *208*
 - Bismark Sea Seismic Lineation (BSSL) **30–31**
 - Bonin islands *165*
 - boninites **181**
 - geodynamic setting **163–164**
 - geodynamic setting in Tonga and New Hebrides **164**
 - intersection between arc and back-arc volcanism **169**
 - subduction trench–transform transition *167*
 - Tofua arc and Lau spreading centre **164–168**
 - Valu Fa Ridge and Tofua arc **168**
 - Vanuatu Trench **168–169**
 - occurrence along Izu–Bonin–Marian (IBM) arc **169–171**
 - geodynamic setting of boninite lavas **178–179**
 - geodynamic setting of Philippine Sea Plate *174*, **175–177**
 - inconsistencies between models **177–178**
 - previous models of boninite formation **175**
 - settings for boninite formation **179**
 - type 1 setting **179–180**, *179*
 - type 2 setting *167*, *179*, **180**
 - type 3 setting *179*, **180**
- Bristol Island *286*
- Brothers volcano *101*, *124*, *143*
 - felsic rocks **102**
 - geochemistry **105**, *108*
 - hydrothermal plumes
 - chemical characteristics **127**

- longitudinal section *145*
- particulate chemistry **150**
- plume mapping *151–152, 153*
- Candlemas Island *286, 287–288, 288*
 - geochemical variations and volcano histories *295*
 - major and trace element composition **290–292**
- Caribbean sea *240*
- Caroline Plate *208*
- Celebes Sea *208, 209*
- Central Lau Spreading Centre (CLSC) *26–30, 26, 27*
- Central Molucca Sea Ridge *209*
- Charlotte Seamount *166*
- Chichi shima island *165*
- China *84*
- Chokai volcano *223*
- Clark volcano *101, 124, 143*
 - felsic rocks **102**
 - hydrothermal plumes
 - chemical characteristics **127**
 - longitudinal section *145*
 - plume mapping *146–147, 147*
- Clew Bay *83*
- Clifden *83*
- Colville Ridge *100, 124*
- Connemara *83, 94–95*
 - arc accretion *83–85*
 - comparison with Taiwan collisional orogenies **93**
 - continuous arc accretion *93–94, 94*
 - cross-section *87*
 - lower crustal–mantle tectonics *88–89*
 - lower crustal delamination *89*
 - lower crustal subduction *89–90*
 - strength of collisional arc lithosphere *90*
 - magmatic evolution *87–88*
 - orogenic exhumation *85–86*
 - post-orogenic basin formation *90–91*
 - sedimentary response to arc collision *86–87*
 - subduction polarity reversal *91–93, 92*
- continental crust formation *67–68*
 - continental crust compared to calc-alkalic andesite *68–69, 68*
- convergence rates of intra-oceanic subduction systems *2–3*
- Cook Island *286, 286, 287*
 - geochemical variations and volcano histories *294–295*
 - major and trace element composition **290–292**
 - new isotope analyses **293**
- Coral Sea *208*
- Cotobato Trench *209*
- Cotton volcano *124, 143*
 - hydrothermal plumes
 - longitudinal section *145*
 - plume mapping *149*
- crustal anatexis *110–113*
 - thermal budget **113**
- crustal evolution of primitive calc-alkaline basaltic magmas *239, 251–252*
 - basalts from St Vincent *241–242*
 - composition *242*
- Lesser Antiles arc
 - composition of eruptive rocks *239–241, 240–241*
 - experimental methods and results *249*
- fractionation of evolved basaltic liquids *251, 252*
- generation of evolved basaltic liquids *249–251, 250*
- mantle genesis of Soufriere basalts
 - constraints on water content of mantle source *247–249*
 - experimental method *242–243, 243*
 - lherzolitic mantle source *243–245, 244, 245*
 - melt extraction from mantle *245–246*
 - water content of primitive basalts *246–247*
- crustal recycling *99–100, 114–116, 115*
 - Kermadec subduction system *100–102, 100*
- Curtis Island *103*
- Curtis volcano *101*
 - felsic rocks **102**
- Daito Ridge *165*
- Delaney Dome *83*
- depleted MORB-source mantle (DMM) *74*
- Discovery Bank *317*
- Djaul Transform (DT) *31, 31, 32*
- Dominica Island *240*
- East China Sea *84*
- East Lau Spreading Centre (ELSC) *26–30, 26, 27*
- East Morotai Ridge *209*
- East Scotia Ridge *286*
 - morphology *319–321, 320*
 - resolving mantle components *333–334, 342*
 - analytical techniques *335–336*
 - compositional variations in dredge samples *336–340, 337, 338, 339*
 - geological background *334–335*
 - He depletion from plume mantle *341–342*
 - plume components *340–341*
- East Scotia Sea
 - back-arc spreading *315–316*
 - earthquake hypocentres *318*
 - East Scotia Ridge morphology *319–321, 320*
 - geochemistry *322–323*
 - plate motions *318–319, 319*
 - seismic anisotropy *321–322*
 - South Sandwich evolution *316–318, 316*
 - mantle flow *315–316, 323–324, 326*
 - classes **324**
 - coupled flow *324–325*
 - inflow and hot-spot flow *325–327*
 - inflow versus mantle wedge control on accretion *328–329*
 - pacific outflow *327–328*
 - ridge migration *327*
 - upwelling *324*
- Endurance Ridge *317*
- Eupo seamount chain *189, 195*
 - eruption ages and volumes *200*
- enriched mantle I component reservoirs *75*
- enriched mantle II component reservoirs *72–75*
- Eurasian Plate *208*
- Eva Seamount *166*
- felsic volcanism *99–100, 114–116, 115*
 - Kermadec subduction system *100–102, 100*
 - occurrence in Kermadec arc *101, 102*
 - geochemistry *104–107, 105, 106, 107, 108, 109, 110*

- Kermadec islands 102–103
 petrography 104
 South Kermadec arc 103–104
 origin of intra-oceanic felsic magmatism 107–110
 structural setting 114
 Fiji 100, 124
 Fiji Fracture Zone 124
 Fiji Islands 26
 Fiji Platform 166
 Fonualei Rift and Spreading Centre (FRSC) 28–30
 Gag 209
 Galway Batholith 83
 Galway Bay 83
 Gebe 209
 Genroku seamount chain 189, 195
 eruption ages and volumes 200
 Gilbert Seamount 166
 Gorotalo Basin 209
 Grenada Island 240
 Grenadine Islands 240
 Guadeloupe Island 240
 Guam 35, 165
 Hachijo Jima 189
 Haha shima island 165
 Halmahera 209
 Halmahera arc 207–208, 208, 217
 data set 209–210
 geochemical evolution
 neogene 210–212
 quaternary 212–214
 geodynamic evolution 215
 geological setting 208–209, 209
 Halmahera intra-oceanic subduction system,
 location 3
 Harvre Trough 100, 124
 Healy volcano 101, 124, 143
 felsic rocks 102
 hydrothermal plumes
 chemical characteristics 127
 longitudinal section 145
 particulate chemistry 150
 plume mapping 149–151, 152
 heat carried by magma, expression for 155
 heat flux, expression for 157
 heavy rare earth elements (HREE) 21
 high-field-strength elements (HFSE) 21
 high-magnesium rati on andesites (HMAs) 64–66
 high-? (HIMU) component mantle reservoirs 72–75
 Hikurangi Plateau 101, 124
 Hikurangi Trough 124
 hot fingers in mantle wedge model 221, 233–235
 across- and along-arc $^{87}\text{Sr}/^{86}\text{Sr}$ variations 227–231,
 228, 229, 230
 basalt composition in NE Japan 221–222
 total alkalis, Al_2O_3 and K_2O 222–226, 225
 dynamic model 233, 234
 elevation–composition relationships 226–227, 226,
 227
 eruption of basalt 231
 magma source material 232–233
 slab depth and thermal structure 231–232
 Hunter Fault Zone 166
 Hunter Fracture Zone 124
 Hunter Ridge 166
 hydrothermal plumes 119–120, 134–135, 158
 particulate chemistry 150, 152–158, 154
 site plume mapping
 Brothers volcano 151–152, 153
 Clark volcano 146–147, 147
 Cotton volcano 149
 Healy volcano 149–151, 152
 Lillie volcano 148–149, 151
 Rumble II (East and West) volcanoes 149
 Rumble III volcano 148–149, 151
 Rumble IV volcano 148
 Rumble V volcano 148, 149
 Silent II volcano 149
 Tangaroa volcano 147–148, 148
 Whakatane volcano 146, 146
 southern Kermadec arc 123–124
 study area regional overview 144
 study methods 124–125, 142–144
 study results 125, 126, 127, 128, 129, 131, 132, 133,
 135, 141–142
 aqueous ionic components 130–134
 gaseous components 125–130
 venting on submarine arc volcanoes 120–123, 121
 chemical properties of volcanic substrates 123
 physical attributes 122
 Intermediate Lau Spreading Centre (ILSC) 26, 27,
 28–30
 intra-oceanic arcs 1–2, 11
 characteristics 2, 4
 accretion versus non-accretion 6
 ages of slabs 3–5
 back-arc spreading 6
 convergence rates 2–3
 crustal thickness and pre-arc basement 6–7
 exhumed arcs 7
 sediment thickness 5
 topography of subducting plates 5
 locations 3
 research themes
 formation of boninites 9–10
 hydrothermal processes 10–11
 mantle flow and back-arc systems 7
 primary magmas and ultramafic keels 7–8
 role of subduction zones in crust evolution 10
 slab-derived chemical components 8–9
 schematic cross-section 5
 Ireland 82, 94–95
 arc accretion 83–85
 comparison of Mayo–Connemara with Taiwan
 collisional orogenies 93
 continuous arc accretion 93–94, 94
 geological map 83
 lower crustal–mantle tectonics 88–89
 lower crustal delamination 89
 lower crustal subduction 89–90
 strength of collisional arc lithosphere 90
 magmatic evolution 87–88
 orogenic exhumation 85–86
 post-orogenic basin formation 90–91
 sedimentary response to arc collision 86–87
 subduction polarity reversal 91–93, 92

- Izu Peninsula *189*
- Izu–Bonin (Ogasawara) arc *165*
 ages of arc volcanism **170–171**, *173*
 laser-heated $^{40}\text{Ar}/^{39}\text{Ar}$ dating *191*, *192–193*
 error estimation and age calculation *193*
 stepwise heating of groundmass *191–192*
 total fusion analysis of plagioclase phenocrysts
192–193
 petrology *188–190*
 study results **194**, **195**, *197*, **197**
 active rift zone *197–198*
 analysis validity *193–195*
 back-arc seamount chains *195–196*
 eastern margin *196*
 isolated seamounts *196*
 study samples *190–191*
 locations *190*
 tectonic setting *188*
 volcanic history *187–188*, *203*
 back-arc region *200–201*
 tectonic implication *201–203*, *202*
 temporal variation *198–200*, *198*, *199*, *200*
- Izu–Bonin Trench *189*, *222*
- Izu–Bonin–Mariana (IBM) forearc *181*
 evolutionary model *174*
 geodynamic setting of boninites *163–164*
 Tonga and New Hebrides *164–169*
 occurrence of boninites *169–171*
 geodynamic setting of boninite lavas *178–179*
 geodynamic setting of Philippine Sea Plate *174*,
175–177
 inconsistencies between models *177–178*
 previous models of boninite formation *175*
 settings for boninite formation *179*
 type 1 setting *179–180*, *179*
 type 2 setting *167*, *179*, *180*
 type 3 setting *179*, *180*
- Izu–Ogasawara (Bonin) intra-oceanic subduction
 system
 characteristics **4**
 location **3**
- Jane Bank *317*
- Jane–Discovery arc *317*
- Japan Sea *222*
- Japan Trench *222*
- Japan, NE *221*, *233–235*
 across- and along-arc $^{87}\text{Sr}/^{86}\text{Sr}$ variations *227–231*,
228, *229*, *230*
 basalt composition *221–222*
 FeO*/MgO and MgO *224–226*, *225*
 total alkalis, Al₂O₃ and K₂O *222–224*, *225*
 basalt-bearing volcanoes **223**, **224**
 dynamic model *233*, *234*
 elevation–composition relationships *226–227*, *226*,
227
 eruption of basalt *231*
 location map *222*
 magma source material *232–233*
 slab depth and thermal structure *231–232*
- Java Sea *208*
- Java Trench *208*
- Kampu volcano *223*
- Kan’ei samount chain *189*, *195–196*
 eruption ages and volumes *200*
- Kermadec arc *99–100*, *114–116*
 felsic rocks *101*, **102**
 geochemistry *104–107*, **105**, *106*, *107*, *108*, *109*,
110
 Kermadec islands *102–103*
 petrography *104*
 South Kermadec arc *103–104*
 hydrothermal plumes *119–120*, *134–135*, *141–142*,
158
 particulate chemistry *152–158*, *154*
 regional overview *144*
 site plume mapping *146–152*
 southern Kermadec arc *123–124*
 study methods *124–125*, *142–144*
 study results *125–134*, *126*, **127**, *128*, *129*, *131*,
132, *133*, *135*
 venting on submarine arc volcanoes *120–123*,
121, *122*, **123**
P–T conditions *111*
 subduction system *100–102*, *100*
 topographic features *101*
- Kermadec Ridge *100*, *124*
- Kermadec Trench *100*, *124*
- Kida–Daito Basin *165*
- Killary Harbour *83*
- King’s triple junction *166*
- Kuril arc *222*
- Kuril Trench *222*
- Kuttara volcano *223*
- La Perouse Seamount *166*
- large ion lithophile elements (LILE) **21**
- Lau Basin *20*, *26*, *100*, *124*, *166*
 axial depths *27*
 bathymetry *27*
 geochemical characteristics *29–30*
 geophysical characteristics *28–29*
 lava geochemistry **22**, *25*
 spreading centres *27*
 tectonic setting *21–28*, *26*
- Lau Extensional Tranfer Zone (LETZ) *26*, *27*, *28–30*
- Lau Ridge *26*, *100*, *124*, *166*
- Lau spreading centre boninites *164–168*
- Leenaun *83*
- Leskov Island *286*
- L’Esperance volcano *101*
- Lesser Antiles arc *239*, *240*, *251–252*
 composition of eruptive rocks *239–241*, *240–241*
 evolution of primitive magmas in arc crust
 experimental methods and results *249*
 fractionation of evolved basaltic liquids *251*, *252*
 generation of evolved basaltic liquids *249–251*,
250
 mantle genesis of Soufriere basalts
 constraints on water content of mantle source
247–249
 experimental method *242–243*, *243*
 lherzolitic mantle source *243–245*, *244*, *245*
 melt extraction from mantle *245–246*
 water content of primitive basalts *246–247*
 primitive calc-alkaline basalts from St Vincent
241–242

- New Hebrides
 geodynamic setting of boninites 164
 Tofua arc and Lau spreading centre 164–168
 Valu Fa Ridge and Tofua arc 168
 Vanuatu Trench 168–169
- New Hebrides Arc 166
- New Ireland 31, 32
- Niije 124
- Niuafu'ou Plate (N) 26
- North Bismark Plate 31
- North Fiji Basin 166
- North Luzon Arc 84
- North Luzon Trough 84
- North Sulawesi Trench 209
- Obi 209
- Oki-Daito Ridge 165
- Okinawa Trough 84
 cross-section 87
- Oshima-oshima volcano 223
- Ototo shima island 165
- Pacific Plate 26, 35, 208
- Palau 165
- Palau Trench 209
- Palau–Kuyshu Ridge 165
- Palu–Koro Fault 209
- Papua New Guinea 31
- Parece–Vela Basin 165
- Peggy Ridge (PR) 26, 28–30
- Philippine Fault 209
- Philippine Sea 84, 209
- Philippine Sea Plate 35, 165, 208
 boninite formation 174, 175–177
 inconsistencies between models 177–178
- Philippine Trench 165, 209
- Pujada 209
- pyroxenite 75
 isotopic evolution 76
- Raoul Island 102–103
- Raoul volcano 101
 felsic rocks 102
 geochemistry 105, 108, 109
- Raukumara Basin 101
- Renvyle–Bofin Slide 83
- Rumble II (East and West) volcanoes 101, 124, 143
 felsic rocks 102
 hydrothermal plumes
 chemical characteristics 127
 longitudinal section 145
 particulate chemistry 150
 plume mapping 149
- Rumble III volcano 101, 124, 143
 hydrothermal plumes
 chemical characteristics 127
 longitudinal section 145
 particulate chemistry 150
 plume mapping 148–149, 151
- Rumble IV volcano 101, 124, 143
 felsic rocks 102
 hydrothermal plume mapping 148
- Rumble V volcano 101, 124, 143
 hydrothermal plumes
 chemical characteristics 127
 longitudinal section 145
 particulate chemistry 150
 plume mapping 148, 149
- Russian Seamount volcano 101, 103
 felsic rocks 102
- Ryukyu Arc 84
- Ryukyu intra-oceanic subduction system: location 3
- Ryukyu Trench 165, 222
- Saba Island 240
- Sahul Shelf 208
- Saipan 165
- Salawati 209
- Samoa 26, 124, 166
- Sandy Bay Tephra 103
- Sangihe 209
- Sangihe arc 207–208, 208, 217
 data set 209–210
 geochemical evolution 214
 geodynamic evolution 215–217, 216
 geological setting 208–209, 209
- Sangihe intra-oceanic subduction system, location 3
- Saranggani 209
- Saunders Island 286
- Seram Trough 208
- Shikoku Basin 165, 189
- Shikostu volcano 223
- Silent II volcano 101, 124, 143
 hydrothermal plumes
 longitudinal section 145
 plume mapping 149
- Slau 209
- Snellius Ridge 209
- Sofu Gan 189
- Solomon intra-oceanic subduction system
 characteristics 4
 location 3
- Solomon Sea Plate 31
- Solomon Slab 32
- Sorong Fault 209
- Soufriere volcano 240
 mantle genesis
 constraints on water content of mantle source
 247–249
 experimental method 242–243, 243
 lherzolitic mantle source 243–245, 244, 245
 melt extraction from mantle 245–246
 water content of primitive basalts 246–247
 primitive calc-alkaline basalts 241–242
 composition 242
- source heat flux expression 157
- South Bismark Plate 31
- South China Sea 84, 208
- South Fiji Basin 100, 124
- South Mayo Trough 83
 cross-section 87
- South Sandwich arc
 evolution 316–318
 location map 256, 286, 316
 magmatism 285–286, 309–310
 analytical methods 289
 Candlemas and Vindication Islands 287–288, 288
 classification 289–294

- crystal structure from seismic studies 295
- cumulative volumes derived from fractional crystallization model 304–306, **305**
- fractionation crystallization 301–306
- geochemical variations and volcano histories 294–295
- major and trace element composition 290–**292**
- nature of mantle source 295–300, 296
- nature of primary magmas 300–301
- new isotope analyses **293**
- origin of high-Al basalts 301–303, 302, 303
- origin of silicic magmas 306–309, 308
- plagioclase control of strontium abundances 303–304, 303
- research history 288–289
- Southern Thule 286–287, 287
- resolving mantle components 333–334, 342
 - analytical techniques 335–336
 - compositional variations in dredge samples 336–340, **337**, 338, 339
 - geological background 334–335
 - He depletion from plume mantle 341–342
 - plume components 340–341
- structure 255, 279–282
 - bathymetry profiles and age–depth relationships 262–263
 - collision model 263
 - gravity modelling 272–279, 273, 274
 - marine magnetic record of back-arc spreading 255–262, 258, 260, 261, 262
 - seismic reflection profiles 263–272, 264, 266, 267, 268, 269, 270
- South Sandwich intra-oceanic subduction system
 - characteristics **4**
 - location **3**
- Southeast Ridges (SER) 31, 31, 32
 - geophysical characteristics 33
- Southern Rifts (SR) 31–32, 31, 32
 - geophysical characteristics 33
- Southern Thule archipelago 286–287, 286, 287
 - geochemical variations and volcano histories 294–295
 - major and trace element composition 290–**292**
 - new isotope analyses **293**
- Southwestern Pacific Basin 124
- St Eustatius Island 240
- St Kitts Island 240
- St Lucia Island 240
- St Vincent Island 240
- subduction, role in evolution of crust and mantle 55–56, 75–76
 - andesite 61
 - calc-alkalic andesite 61–63, 62, 63, 66
 - magma mixing 63–67
 - arc magmatism 56–57
 - geochemical modelling **59**
 - incompatible element chemistry 58–61
 - volcano distribution 57–58, 57
 - continental crust formation 67–68
 - calc-alkalic andesites versus continental crust 68–69, 68
 - geochemical examination of magma mixing 69–72, 70, **71**, 72
 - evolution of geochemical reservoirs in mantle 72
 - delaminated pyroxenite 75
 - oceanic crusts and sediments 72–75
 - processes 56
- Sula Besi 209
- Sula Islands 209
- Sulawesi 208, 209
- Sulu Islands 209
- Sulu Sea 208, 209
- Sumisu Jima 189, 190
- Sumisu Rift 190
- Sunda Trench 208
- Sundra Shelf 208
- Taiwan 94–95
 - arc accretion 83–85
 - bathymetric map 84
 - comparison with Connemara collisional orogenies **93**
 - continuous arc accretion 93–94, 94
 - geological map 86
 - lower crustal–mantle tectonics 88–89
 - lower crustal delamination 89
 - lower crustal subduction 89–90
 - strength of collisional arc lithosphere 90
 - magmatic evolution 87–88
 - orogenic exhumation 85–86
 - post-orogenic basin formation 90–91
 - sedimentary response to arc collision 86–87
 - subduction polarity reversal 91–93, 92
- Taiwan–Sinzi Foldbelt 84
- Talaud Islands 209
- Taliabu 209
- Tangaroa volcano 101, 124, 143
 - felsic rocks **102**
 - hydrothermal plumes
 - chemical characteristics **127**
 - longitudinal section 145
 - particulate chemistry **150**
 - plume mapping 147–148, 148
- Ternate 209
- Thule Island 286–287, 286, 287
 - geochemical variations and volcano histories 294–295
 - major and trace element composition 290–**292**
 - new isotope analyses **293**
- Tidore 209
- Tifore 209
- Timor Trough 208
- Tofua arc boninites 164–168
- Toglan Islands 209
- Tomini Bay 209
- Tonga
 - geodynamic setting of boninites 164
 - Tofua arc and Lau spreading centre 164–168
 - Valu Fa Ridge and Tofua arc 168
 - Vanuatu Trench 168–169
- Tonga arc 166
- Tonga Ridge 26, 100, 124
- Tonga Trench 26, 100, 124, 166
- Tonga–Kermadec subduction system 100–102, 100, 124
 - characteristics **4**
 - location **3**
- Tori Shima 189

- Toya volcano 223
- Una-Una 209
- Urdenata Plateau 165
- Valu Fa Ridge (VFR) 26–30, 26, 27, 166
 boninites 168
- Vanuatu arc 166
- Vanuatu (New Hebrides) intra-oceanic subduction system
 characteristics 4
 location 3
- Vanuatu Trench 166
 boninites 168–169
- Vauban Seamount 166
- Vening Meinez Fracture Zone 101
- Vindication Island 286, 287–288, 288
 geochemical variations and volcano histories 295
 major and trace element composition 290–292
- Visokoi Island 286
- Vitiaz Trench 124
- volcanic arcs 1, 11
 global distribution 120
 volcano distribution at convergent plate margins 57–58, 57
- Volsmar Seamount 166
- Waigeo 209
- Weda Bay 209
- Weitin Transform (WT) 31, 31, 32
- West Mariana Ridge 35
- West Philippine Basin 165
- western extensional basins (WEB) 25–26
- Westport 83
- Whakatane volcano 124, 143
 hydrothermal plumes
 longitudinal section 145
 plume mapping 146, 146
- White Island 124
- Willaumez Transform (WIT) 31, 31
- Zambales 165
- Zamboanga 209
- Zavodovski Island 286
- Zenisu Ridge 189