Index

Page numbers in italic denote figures. Page numbers in bold denote tables.

Abadia marls 47, 48
  characterization 59–64, 61
  compressibility 66–67
degradation, laboratory testing 64–72
  strength 71–72
Aberdeen Tunnel Portal 79
Acholi Surface, very deep weathering 9
Acri, Calabria, slope instability 110, 111
African Planation Surface,
  very deep weathering 9, 11
Alaco River basin, landslides 118, 120
Allaro River basin, landslides 120–121
alluviation 43
alluvium, Oltrepo Pavese 219, 220, 221, 224, 226, 227, 229–231
Alps, southern, Black Marls, erosion 201–212
Altavilla landslide 111
alteration, hydrothermal 6
alveolization, Lalibela churches 139, 145
Amba Aiba Formation 133, 134, 140
Amba Alaji rhyolites 133–134
Ancona Clay 23
40Ar/39Ar dating 10
Ashangi Formation 133
Aspromonte Massif 106, 108, 109, 110
  weathering and slope failure 121–126, 127
Assi River, landslides 118
Australia, deep weathering 9, 10, 11
bacteria 6
badlands, Black Marls, erosion 201–212
Bagnara Calabra, slope instability 126
Balsam Gap II landslide 150
Barcelona Basic Model 69
basalt
  Brazil 167
  deep weathering 6
  Lalibela 133–134, 136
  weathering 138–147
  see also greenstone
bedrock 2
  landslides, Ropice Mt. 192, 193, 194
  Oltrepo Pavese 218, 219, 220
Veladero massif 37
weathered, Oltrepo Pavese 218, 219, 220
bengang landform 39
Biet Abba Libanos 133
  laboratory testing 134–136
weathering 138, 139, 140, 145–146, 147
Biet Amanuel, weathering 140, 144, 147
Biet Dabra Sina, weathering 142–143
Biet Danagel, weathering 142, 143
Biet Gabriel-Rufael, weathering 139, 146
Biet Golgota, weathering 139
Biet Gyiorgis 132
  weathering 139, 146
Biet Marqorewos, weathering 139, 143, 145
Biet Maryam, weathering 140, 142
Biet Mascal, weathering 142
Biet Medane-Alem 134
  weathering 139, 140, 142
Biet Mikael-Golgota, weathering 142–143
biogeochemistry 6
Bisaccia clay Golgota 25, 26, 27–29, 30
Black Marls, Southern Alps
erosion 201–212
cone-resistance 205
  observation 203–206, 207, 208–209
  rainfall 206, 208
Bohemian Massif, very deep weathering 10
Bradshaw Surface, very deep weathering 10
Brazil
  geology 168
  residual soils 167–181
  weathering, granite and gneiss 35, 36, 37, 41–42
Brazilian test 71, 72, 176, 178, 179
Buonamico landslide 121–122
Calabria, Italy
  Aspromonte Massif 121–126
  Coastal Chain 113–115
  geology 106–109, 110
  Poro Massif 115–117
  Serre Massif 117–121
  Sila Massif 109–113
  slope instability, weathered granite 39, 42, 106
  weathering, crystalline rock 105–127
Calabrian Arc 106, 108, 126
carbonation 6
Carpathians, Flysch, weathering and landslides 183–198
Casagrande plasticity chart 223, 224
Cenozoic, weathering 10, 33, 118, 126
Čertův Mlyn Mt, spreading ridge 187, 188, 189, 190, 191
Chai Wan Road landslide 78, 96, 97
chalk marl, deep weathering 6
Champlain Clay, CPTU tests 20, 21
Channel Tunnel, chalk marl weathering 6
  channels, permeable 96, 97
Chaotic Complex 215, 219, 220
china clay see kaolin
China, SE, deep weathering, granite 37–39, 42
Ching Cheung Road landslide 79, 87, 96, 97, 98
chlorite 6
Chung Hom Kok landslide 92, 93
clay
  deep weathering 6, 11
  overconsolidated
deterioration 15–30
  macroscopic features 16–17
  mechanical processes 18–25
  physico-chemical processes 25–30
  quick, landslides 25, 27
clay shales
deterioration 15–30
  macroscopic features 16–17
clay soils
  Oltrepo Pavese 217, 218, 219
  shear strength tests 219–225
  weathered, residual shear strength, Oltrepo Pavese 213–223
Coastal Chain 106, 109, 110
  weathering and slope failure 113–115
cohesion
  clay soils 18, 23, 30
  Hong Kong 86, 92
  lateritic soils, Brazil 173, 175, 179
  loss of 11
  Pamplona marls 58
colluvium
  definition 150
  Hong Kong 88
  Oltrepo Pavese 215, 217–219, 220, 224, 226, 228, 229–231
colonization, biological, Lalibela 139, 140
compressibility, Abadia marls 66–67
cone-resistance, Black Marls 205
corestones 6–7, 8, 9, 34
  falling 40
  Hong Kong 82, 83
  Meghalaya Plateau 36
  Veladero massif 37
CPTU tests 20, 21
Cretaceous, weathering 10, 11
Culebra shale 23
Czech Republic, weathering and landslides, Flysch Carpathians 183–198
Darcy–Weisbach friction factor, Black Marls badlands 203, 207, 209, 211
debris avalanches 37, 38, 119
debris flows
  miniature, Black Marls badlands 203–205, 207, 208–212
  Mucone River 112, 113
  Pamplona marls 50
  Serre Massif 117, 118, 119, 120
  weathered granite and gneiss 37, 38, 39, 41, 42, 43
debris slides, weathered granite and gneiss 38, 39, 40, 43
degradation, marl, Iberian Peninsula 47–74
destructuring 18, 23, 30, 66
deterioration
  hard clays and clay shales 15–30
  macroscopic features 16–17
  mechanical processes 18–25, 30
  physico-chemical processes 25–30
domes, weathered granite and gneiss, mass movement 36, 37
Draix experimental basins, sediment transport 201–212, 204
dykes, groundwater partitioning 96
earthflows 37, 41, 43, 192
efflorescence 139–140
El Bierzo clay 47, 48
Eocene, weathering 10, 118
erosion
  Black Marls badlands 201–212
  observation 203–206, 207, 208–209
rainfall 206, 208
see also stripping
fatigue 20, 30
fault zones, weathering and landslides, Flysch Carpathians 184, 186, 187, 188, 192
faults, normal Calabria 109
fissures, and softening 22, 23, 30
flysch, weathering and landslides, Carpathians 183–198
freeze-thaw cycles 24, 139, 203
friction angle, residual 57–58, 85, 180
  Oltrepo Pavese 217, 223–225, 227, 229, 231
gabbro, deep weathering 6
glafmorphology, and landslides 33, 41–43
gneiss
  Calabria 108
    Aspromonte Massif 121–124, 126
    Sila Massif 109–113
depth weathering 33
    Mesozoic 10
    SE Brazil 35, 36, 37
residual soil profile, Brazil 167, 169, 170, 171, 173
Godula Formation 182, 192
Gondwana Surface 11
granite
  Brazil 167
  Calabria 105–106
    Aspromonte Massif 124
    Sila Massif 109–113
deep weathering 5, 6, 9, 12, 33–34
  Hong Kong 37–39
  mass movement 37–41
    Meghalaya plateau 36
    SE Brazil 35, 37
  Hong Kong 77, 79, 80, 81, 82, 84, 85
weathering profile 6, 7, 34, 35
granitoids, Calabria 117–118
granodiorite
  Calabria, Sila Massif 109–113
  Hong Kong 77, 79
greenstone, deep weathering 5
groundwater
  deep weathering 7, 13
  partitioning 95–96
  grus 6, 33, 39, 40
  Guangdong Province, weathered granite 39
gullying 42, 43, 201
Hlubocˇe landslide 192, 195
Hong Kong
cohesion 86
corestones 82, 83
deep weathering 8
  granite 37–39
  landslides 11–13
geology 77, 78
  granite 77, 79, 80, 81, 82, 84, 85
  hydrogeology 85, 86, 88–89, 90
  landslides 77–100
  mechanisms 91–100
  saprolite, shear strength 85–86
INDEX 237

suction 86
volcanic rock 77, 78, 79, 80, 82, 85–86
weathering 77–78, 81
rock properties 84–88
Hong Kong Island 80
Hunters Crossing, North Carolina 152, 154
geology 150, 151, 153
weathered rock slide 153–154
geophysical survey 157–159
hydraulic conductivity 161
inclinometry 161
subsurface analysis 153–157
surveying 160–161
hydrogeology, Hong Kong 85, 86, 88–89, 90
hydrolysis 6, 10
Iberian Peninsula, degradation of marls 47–74
illite 27, 37
inselbergs 43
ion diffusion 27, 30
Japan, slope instability, weathered granite 39, 41
joints 1, 6, 12
Hong Kong 8, 84–86, 97, 100
Lalibela churches 140, 145
weathered granite 40
kaolin, residual gneissic soil, Brazil 167, 172
kaolinite 5, 6, 10, 27, 37
Kobylick slope failure 187
Kowloon Peak 79
Lai Ping Road landslide 96, 100
Lalibela, Ethiopia
churches 131, 132, 133
degradation 131, 136–147, 141
laboratory testing 134–138
weathering 138–140
geology 131, 133–134, 135
landforms
depositional 42
erosional 41–42
landslides
Aspromonte Massif 121–126
Coastal Chain 113–115
hazard assessment 43
Hong Kong 77–100
mechanisms 91–100
massive bedrock, Flysch Carpathians 192
Oltrepo Pavese 215–216
Poro Massif 115–117
and rainfall
Hong Kong 88, 89–100
Oltrepo Pavese 215–216
saprolite 11–13, J2
Serre Massif 118–121, 119
shallow 90, 92
Sila Massif 111–113
weathered granite 37, 41
geomorphology 41–43
and weathering 1, 2
deep 11–13
Flysch Carpathians 183–198
Lantau Island 77, 78, 79, 92
laterite
Brazil 168, 170, 172
see also soil, lateritic
laterization 167–168
Leung King Estate landslide 92, 94
lichen, Lalibela 139, 140
Lilla claystone, degradation 47–48, 49
limit state surface 20, 22, 23
lithorelicts 17, 18, 20, 21
London Clay
softening 22–23, 24
strength 16, 17
Luzzi, Sila Massif, slope instability 113
Malá Brodská earthflow 187, 192
Malawi, mass movement, weathered granite 39, 41
Malaysia, weathered granite 91
Manning’s roughness coefficient, Black Marls badlands 203, 207, 209, 211
Maranboy Surface, very deep weathering 10
marl
degradation, Iberian Peninsula 47–74
erosion, Black Marls 201–212
mass movement 2
Calabria 106–127
weathered granite 37–41
Massif Central, very deep weathering 10
Meghalaya Plateau, NE India, granite weathering 36
Mesozoic, weathering 9, 10, 33
metamorphism, Calabria 106, 107, 108, 121
methylene blue stain test 214, 216–217
clay soils, Oltrepo Pavese 217, 219–221, 220, 229, 230, 231–232
Mexico, South, mass movement, weathered granite 37, 38
micro-organisms 6
Mid Levels District, Hong Kong 80
mineralization, deep weathering 6, 7
Minnesota, deep weathering 10
Miocene, weathering 10
Mohr envelope, residual soils 173, 177, 179–180
Monreal Dam, Pamploña marls 51–59
laboratory testing 53–58
Monte Piano Marls 215, 219, 220, 221, 231, 232
montmorillonite, weathering, Lalibela 138, 139–140, 146–147
Morton Gneiss 10
Mount Kosciusko, Australia, deep weathering 9
Mt Granieri–Salincriti slope 120, 121
Mucone River, mass movement 110, 111–113, 114
mudslides 17, 18, 20–21, 22, 29
Norseman, Australia, deep weathering 10
Oltrepo Pavese
clay soils 217, 218, 219, 220, 221
methylene blue value 217, 219–221, 229, 230, 231–232
residual shear strength 213, 217–219
geology 214–215
ore, supergene 7–9, 11
osmosis 27, 28, 29–30
Ouro Preto, Brazil, residual gneissic soil 171, 172, 174
oxidation 6, 7–9
INDEX

pipe systems 88
weathered granite and gneiss 34–35, 37, 38
schist, Calabria 121, 124
scoriae, Lalibela 134, 137–138
sediment transport, Black Marls badlands 201–212
Serra di Buda landslide 111, 112
Serra do Mar, weathering and geomorphology 35, 36, 37
Serre Massif 106, 108, 110
geology 117
slope instability 39
weathering 117–118, 126
slope failure 39, 118–121, 127
shear strain, plastic 18, 20
shear strength 16, 20, 26, 27
Hong Kong saprolite 85–86
Pamplona marls 55, 57–59
residual
Kanji test 217, 220
Oltrepo Pavese 213, 217–232, 220
and methylene blue value 214, 217, 219–221, 229, 230, 231–232
residual soil, Brazil 173–181
shear zones 18, 19, 20–21
Shek Kip Mei landslide 86
Shum Wan Road landslide 11–13, 78, 92, 93
Sila Massif 106, 108, 110
geology 109
weathering 109, 111, 126
slope failure 111–113
Skalická Strážnice Hill landslide 192, 194, 196, 197
slickensides
alluvium, Oltrepo Pavese 219
saprolitic soil, Brazil 170
slope deterioration 97, 99
slope failure
Calabria 39, 42, 106–127
Flysch Carpathians 187
geomorphology 41–43
rainfall 89, 90, 91
residual soils, Brazil 179–180
and soil deterioration 15–16
see also mass movement
slumping see rotational slides
smectite 5, 27, 37
Snowy Mountains, very deep weathering 6, 11
softening 16, 21–25, 30
soil
definition 6
deterioration, and slope failure 15–16
lateritic
Brazil 167–168, 169, 170–175, 176, 179, 180
slope stability 179–180
identification 173
residual, Brazil
residual friction angle 180
shear strength 173–181
structure 170–173
saprolitic, Brazil 167–168, 169, 170, 171, 172–175, 176, 179, 180
soil slips 119
South Bay Close landslide 78, 96
Stilaro River basin, landslides 118, 120
strain, volumetric 21–25

Pamplona marls 47, 49–59, 73
characterization 49
laboratory testing 53–58
Monreal Dam 51–59
roughness profile 55, 56, 57, 58
shear strength 55, 57–59
stability problems 50
weathering profile 51, 52, 53
Papua New Guinea, deep weathering 10, 35
pedogenesis 139
phyllite, weathering, Calabria 114–115, 121
pipe systems 37, 38, 42, 84, 87, 88, 90, 124
Pizzotto–Greci slope 114–115
planation surfaces 10–11
plasticity
Oltrepo Pavese 223, 224–226, 229, 230
overconsolidated clays and shales 23–25
Platì, sacküng phenomenon 124, 125
Po River Plain 214, 215, 216
Po Shan Road landslide 11, 80, 97, 100
Pollino Mountains 106, 110
pore fluid composition 25, 27
pore pressure 11, 15, 16, 20, 40
see also suction
Poro Massif 106, 108, 110
weathering and slope failure 115–117
Puerto Rico, mass movement, weathered granite 39
quartz monzonite, Hong Kong 77, 79
rainfall
and erosion, Black Marls badlands 206, 208
and landslides 42–43
Hong Kong 11, 13, 88, 89–100
Hunters Crossing 162–163
Oltrepo Pavese 215–216
and slope failure 15
regolith 6
black Marls badlands 203
ridges, deep-seated spreading, Čertův Mlyn Mt 187, 188, 189, 190, 191
rock slides, weathered, Hunters Crossing, North Carolina 149–164
rockfall, Hong Kong 92
Ropice slope failure 187, 192, 193, 194
rotational slides 119, 122
Flysch Carpathians 190, 192
Hunters Crossing 153
weathered granite and gneiss 37, 39, 40–41, 42, 43
Roubine experimental basin, sediment discharge 203, 204, 205, 207, 208, 209–211
roughness profile, Pamplona marls 55, 56, 57, 58
S. Pietro in Guarano, Calabria, slope instability 110, 111
sacküng phenomenon 115, 121, 124, 125
salt weathering, Lalibela 138–139
San Francisco landslide 111
Santo Miele landslide 113, 115
saprolite 8, 9
definition 6–7, 150, 167
gneiss, Brazil 169
landslides 11–13, 12, 37
strain-softening 18, 30
stress paths 15, 16
stripping 9–10, 42, 43
suction 1
Abadia marls 64–71
Calabria 127
Hong Kong 86, 90, 92, 93
residual soils, Brazil 175
sulphide zone 8–9
surface water flow 91, 92
Sweden, deep weathering 8, 10, 12
swelling
Abadia marls 64–71
clay soils 23–25, 26, 28–29
Tai Tam Reservoir, Hong Kong, weathered granite 81, 82
Termaber Formation 133, 134
Terres Noires see Black Marls
Thistle landslide 12, 13
Tijuca Massif 37, 40–41
Tipperary Surface, very deep weathering 10
Todi Clay 23, 24
Tsing Yi Island landslide 79, 87, 89, 99
Tuen Mun Highway landslide 95, 96
tuff, Lalibela 134–136, 137–139
weathering 138–147
Uganda, very deep weathering 9
uplift, Calabria 109, 110, 113, 122, 124, 126
Upper Lias Clay, strength 16, 17
Utah, Thistle landslide 12, 13
Vaculov-Sedlo landslide 186, 192
Vallone Colella, mass movement 121, 122, 123, 124
Veladero massif, mass movement, weathered granite 37, 38, 42, 43
Velká Čantoryje Mt, rotational slides 190
Velký Stozˇek landslide 187
veneers 17
Venezuela, mass movement, weathered gneiss 39
Victoria Peak, Hong Kong 80
volcanic rock 82
volcanic rock, Hong Kong 77, 78, 79, 80, 82, 85–86
washouts, Hong Kong 91, 92
water table
deep weathering 7
perched 40, 89, 90, 92, 94, 95–96, 215
rise 90, 97, 98
weathering
chemical 6
Hong Kong 77–78
rock properties 84–88
terminology 78, 82
Lalibela churches 138–147
and mass movement 37–41
Calabria 105–127
Aspromonte Massif 121–126
Coastal Chain 113–115
Poro Massif 115–117
Serre Massif 117–121, 126
Sila Massif 109–113, 126
Flysch Carpathians 183–198
physical 6
very deep 5–13
age 9–10
depth 7–9
global distribution 5
granite 33–38
and landslides 11–13
processes and products 6
profile 6–7, 34, 35
rock types 5–6
weathering front 7, 34
Hong Kong 77
weathering grade 3, 34, 40, 83
Calabria 111, 117, 120, 126
and mass movement 39–41
weathering profile 6–7, 34, 35, 81
Pamplona marls 51, 52, 53
residual soils 168
wetting-drying cycles 24, 61–62, 64, 65, 66–68, 203
Winnipeg clay, testing 24
Yip Kan Street landslide 77, 79
Zebedassi Limestone 215, 218, 219, 220, 231, 232