

Index

Index of names

Arago, Francois, 61, 71
Bartolinus, Erasmus, 24
Biot, Jean Baptiste, 48
Brewster, Sir David, 3, 16, 74, 78
Faraday, Michael, 39–45
Fresnel, Augustin, 99
Herapath, William Bird, 3
Kerr, John, 43–45
Land, Edwin, 3–4
le Bel, Joseph Achille, 48
Malus, Etienne-Louis, 71–74, 78
Maxwell, James Clerk, 41, 43
Nicol, William, 27
Pasteur, Louis, 46–59
Rayleigh, Lord, 60
Tyndall, John, 60–61
van't Hoff, Jacobus Henricus, 48
Verkhovskaya, Irene, 102
von Frisch, Karl, 65, 103–106
Wheatstone, Charles, 68–69

Subject index

absorption colours, 14
amino acids (*see also* enzymes, proteins), 54–57
anisotropy, 20–38
astronomy, 42–43, 68–70, 83

birds, 65, 86, 116–117
birefringence, 7–19, 20–38, 73
Brewster's angle, 68, 74–85

cellophane, 7–16, 35, 92
chirality, 46–59, 62–63, 97–100
circular birefringence, 97–100
circular dichroism (Cotton effect), 97, 100–101
circular polarisation, 83, 87–101
compensators, 35–36
compound eyes
 bees, 65, 104–108, 111
 other insects, 79–80, 109–111
 crustacea, 103, 108, 110–111
cotton fibres, 36, colour plate 21
crustacea, mantis shrimp (*Squilla*), 108
 water fleas (*Daphnia*), 102–103, 110

- crystals (*see also* minerals, tartrates), 3, 13, 20–38
 copper acetate, 23, 25, colour plate 14
 germanium, 84–85
 herapathite, 3, 16, 22
 ice, 21, colour plate 12
 liquid crystals, 36–38
 salol (phenyl salicylate), 21, colour plate 13
 sodium chlorate, 33, 58–59
 sodium chloride, 20–21
 sodium nitrate, 24–25, 30
 crystal lattices, 20–21, 29–30, 58–59
- dextrorotatory, 46–59
 dichroism, 22–24, 106–110, 113–116
 dichroscope, 24–26, colour plate 14
 double image prisms, 26
- electromagnetic waves, 3, 29–30, 41
 electro-optical rotation, 43–45, 49
 elliptical polarisation, 91–92, 95, 97
 enzymes, 56–57
- Faraday effect, 40–43, 49
 fishes, anchovies, 115–116
 goldfish, 116
 sunfish, 117
 trout, 116
 Fresnel rhomb, 95–96
- glass, annealing, 18–19
 toughened, 19
 glyceraldehyde, 54
- grids, 2–3
- Haidinger's brushes, 117–118
 hair, 36, colour plate 19
 half-wave plate, 8, 15–16, 30, 87, 92
 helix (conventions), 54–56, 87–89
- insects, ants, 108–109
 bees, 65, 103–108
 chafer beetles, 100–101
 dragonflies, 80, 109
 water boatman bug, 79–80, 109
- interference colours, 13
 iridescence, 78
- kaleidoscopes, 3, 16–17, colour plate 8
 Karolus cell, 43
- laevorotatory, 46–59,
 lead borate, 41–42
 Lissajou's figures, 91–92
- magneto-optical rotation, 40–43, 49
 Malus' experiment, 73–74
 mesotartaric acid, 49–51
 minerals (*see also* crystals)
 andaluzite, 66
 calcite (Iceland spar), 24–32, 66, 71
 cordierite, 66–67
 epidote, 22, 66
 gypsum (selenite), 16, 31, 34–35, 68, colour plate 18
 mica, 16, 31, 34, colour plate 17

- quartz, 30–35, 58–59, 71,
 colour plate 16
- ruby, 23
- sapphire, 23, 25
- tourmaline, 22, 29, 34, 66, 75
- mirror images, crystals, 47–48,
 58–59
- molecules, 48–59
- retarder plates, 14–15, 97,
 colour plate 5
- Newton's colours (*see also*
 retardation colours), 13
- Nicol prisms, 6, 16, 22, 27–29,
 68, 75
- nitrobenzene, 43–44
- octopus, 111–112
- ommatidium, 104–110
- optical activity, 33, 46–59, 62,
 97–100, colour plate 24
- optical isolator, 42–43
- pharmaceuticals, 57–58
- photoelasticity (stress analysis),
 17–19, colour plates 9,
 10
- photographic filters, 82–83, 94–
 95
- pleochroism (trichroism), 23,
 66
- Pockel cells, 44–45
- polar clocks, 68–69
- polarimeters, 51–52, 59
- polariscopes, colour contrast,
 16, colour plate 7
- cordierite, 66–67
- Cotton, 93–94, 98, 101
- dichroscope, 24–26, colour
 plate 14
- Minneart's, 15–16
- Nicol prisms, 27–29
- reflecting, 74–76
- simple polaroid, 5–6
- polarising microscope, 34–36,
 colour plates 15, 16, 19,
 20, 21
- polaroid, 3–6
- polaroid sunglasses, 19, 38, 78–
 79, 86
- polymer chains, 7–8, 21
- polymethyl methacrylate (per-
 spex, plexiglass), 17,
 74–76
- Prince Rupert's drops, 19,
 colour plate 11
- proteins, 54–57
- quarter-wave plate, 30, 34, 83,
 87, 92–93, 95
- racemic acid/racemates, 46–50,
 57–58
- rainbows, 81–82, colour plate
 25
- Rayleigh scattering, 60
- reflection by dark metals, 83–
 84
- by shiny metals, 84, 95–98
- by transparent glass etc, 71–
 86
- by water, lakes etc, 71–86,
 colour plates 26, 27
- total internal, 95–96
- retardation, 8–17, 87–92
- retardation colours, 10–16, 62,
 97, colour plates 1–21,
 23
- retardation plates, cellophane,
 35, colour plate 5

- mica, 34–35
- retardation wedges, gypsum, 35, colour plate 18
- quartz 35
 - step wedges 13, 35, colour plates 4, 6
- retina, 104, 114–116
- retinula, 105–111
- rock sections, 34, colour plate 15
- saccharimeters, 51–52
- scattering of light, 60–70, colour plates 22, 23, 24
- selenite stage, 34
- silk, 36, colour plate 20
- sky, colour, 60–65
 - polarisation, 63–69, 103–104, 107–110, 112–114
- sky compass, 65–68, 103–104, 108–110, 112–114, 117
- spectroscope (improvised), 13
- spiders, 112–114
- stack of plates, 76–78, 95
- starch grains, 36–37
- stereoisomers, 48–58
- stress analysis, 17–19, colour plates 9, 10
- sugars, 51–54, 56–57, 62–63, colour plate 24
- sun compass, 65, 109
- sunstone, 66–68
- tartaric acid/ tartrates, 46–51
- thalidomide, 57
- trichroism (pleochroism), 23
- turpentine, 58
- Tyndall scattering, 60–63
- ultraviolet light, 60, 65, 80, 105–109, 117
- vectors, 8–11, 98–100
- Vikings, 65–67
- visual pigments, 106–111, 114–115