

Index of species

Bird names are according to Howard, R. & Moore, A. (1991) *A Complete Checklist of the Birds of the World*, 2nd edn, London: Academic Press; mammal names are according to Nowak, R. M. (ed.) (1991) *Walker's Mammals of the World*, 5th edn, Baltimore: Johns Hopkins University Press.

- Adélie penguin, *Pygoscelis adeliae* (Spheniscidae, Sphenisciformes) 169(n67)
- African elephant, *Loxodonta africana* (Elephantidae, Proboscidea) 87, 196, 262
- African ground squirrel, *Xerus inauris* (Sciuridae, Rodentia) 244, 245–6
- Alaskan malamute, *see* domestic dog
- albatross, species of Diomedeidae (Procellariiformes) 145
- American coot, *Fulica americana* (Rallidae, Gruiformes) 193
- American crow, sometimes called common crow, *Corvus brachyrhynchos* (Corvidae, Passeriformes) 160, 253
- American robin, *Turdus migratorius* (Turdidae, Passeriformes) 308
- ants, species of Formicidae (Hymenoptera) 63, 96, 176–7, 206(n27), 256, 315, 355–6; *see also* fire-ant, harvesting ant, slave-making ant
- Arabian babbler, *Turdoides squamiceps* (Timaliidae, Passeriformes) 216–17, 240(n22), 256
- Arabian oryx, *Oryx leucoryx* (Bovidae, Artiodactyla) 268
- Atlantic salmon, *Salmo salar* (Salmonidae, Salmoniformes) 79, 90, 122
- baboons, *Papio* spp. (Cercopithecidae, Primates) 178, 361; *see also* gelada baboon; hamadryas baboon; yellow baboon
- barnacle goose, *Branta leucopsis* (Anserinae, Anatidae, Anseriformes) 124, 154–5, 158, 168(n47), 169(n66), 242(n64)
- barn swallow, *see* swallow
- Bateleur eagle, *Terathopius ecaudatus* (Accipitridae, Falconiformes) 244
- bee-eaters, species of Meropidae (Coraciiformes, Aves) 278, 361; *see also* European bee-eater; white-fronted bee-eater
- bees, species of Apidae (Hymenoptera); when 'social bees' is used, we refer to species of *Apis* and in particular *A. mellifera* 35, 96, 176, 206(n27), 315
- Bengalese finch, *Lonchura striata* (Estrildidae, Passeriformes) 230
- blackbird (European), *Turdus merula* (Turdidae, Passeriformes) 82, 83, 102(n42), 206(n29)
- black grouse, *Tetrao tetrix* (Tetraonidae, Galliformes) 167(n6)
- black rat, *Rattus rattus* (Muridae, Rodentia) 133–6, 137, 339–40
- black-tailed deer, *Odocoileus hemionus columbianus* (Cervidae, Artiodactyla) 271
- black-tailed prairie dog, *Cynomys ludovicianus* (Sciuridae, Rodentia) 299(n29)

- blue-and-gold macaw, also called blue-and-yellow macaw, *Ara ararauna* (Psittacidae, Psittaciformes) 113
- blue jay, *Cyanocitta cristata* (Corvidae, Passeriformes) 81
- blue tit, *Parus caeruleus* (Paridae, Passeriformes) 173, 193
- boobies, species of Sulidae (Pelecaniformes, Aves) 161
- bottle-nosed dolphin, *Tursiops aduncus* (Delphinidae, Delphinoidea, Cetacea) 93
- bou-bou shrikes, *Laniarius* spp. (Laniidae, Passeriformes) 159
- bower-birds, species of Ptilonorhynchidae (Oscines, Passeriformes) 76–7, 125, 284, 286–7, 339, 353; *see also* Macgregor's gardener bower-bird; Vogelkop gardener bower-bird
- brown rat, *Rattus norvegicus* (Muridae, Rodentia). Includes the 'laboratory rats' used by experimental psychologists, which are domesticated (often albino) varieties of the brown rat 11, 69, 71, 76, 116, 194, 198–9, 201, 233, 263, 310, 333, 336
- budgerigar, *Melopsittacus undulatus* (Psittacidae, Psittaciformes) 93, 150, 185–6, 193, 207(n41, n52)
- cabbage butterflies, includes both the large white, *Pieris brassicae*, and small white, *Artogeia rapae*, (Pieridae, Lepidoptera) 354, 369(n10)
- cactus ground finch, *Geospiza scandens* (Geospizinae, Emberizidae, Passeriformes) 129
- California ground squirrel, *Spermophilus beecheyi* (Sciuridae, Rodentia) 139(n38)
- canary, *Serinus canaria* (Carduelinae, Fringillidae, Passeriformes) 193, 307, 323
- catta lemur, also called ring-tailed lemur, *Lemur catta* (Lemuridae, Primates) 256
- chaffinch, *Fringilla coelebs* (Fringillidae, Passeriformes) 281
- cheetah, *Acinonyx jubatus* (Felidae, Carnivora) 81, 118, 271
- chicken, *Gallus gallus* (Phasianidae, Galliformes) 20, 79, 113–14, 152, 316, 320
- chimpanzee (common), *Pan troglodytes* (Pongidae, Primates) 23, 93, 96, 279–80, 285, 302(n78)
- chingolo sparrow, *Zonotrichia capensis* (Emberizidae, Passeriformes) 153, 281
- chukar partridge, *Alectoris chukar* (Phasianidae, Galliformes) 63, 67–8, 71, 81–2, 91, 100–1(n1), 110, 163, 356
- cliff swallow (American), *Hirundo pyrrhonota* (Hirundinidae, Passeriformes) 331–3
- coal tit, *Parus ater* (Paridae, Passeriformes) 35
- cockroaches, species of Blattodea (Dictyoptera) 354, 355, 356
- collared flycatcher, *Ficedula albicollis* (Muscicapidae, Passeriformes) 122, 123, 139(n44)
- common eider, *Somateria mollissima* (Anatidae, Anseriformes) 242(n64)
- common raccoon, *Procyon lotor* (Procyonidae, Carnivora) 10
- common raven, *Corvus corax* (Corvidae, Passeriformes) 260–1, 273
- common tern, *Sterna hirundo* (Sternidae, Charadriiformes) 122, 150, 167(n21)
- corn bunting, *Emberiza calandra* (Emberizidae, Passeriformes) 153
- cowbird (North American), brown-headed cowbird, *Molothrus ater*, and bronzed cowbird, *M. aeneus* (Icteridae, Passeriformes) 126, 153

406 Index of species

- coyote, *Canis latrans* (Canidae, Carnivora) 261
- cuckoo (European), *Cuculus canorus* (Cuculidae, Cuculiformes) 74, 303(n105)
- Darwin's finches, also called Galapagos finches, species of Geospizinae (Emberizidae, Passeriformes) 84, 128–9, 295; *see also* cactus ground finch; medium ground finch
- deer mouse, *Peromyscus maniculatus* (Cricetidae, Rodentia) 71, 124
- diamond-back terrapin, *Malaclemys terrapin* (Emydidae, Testudines, Reptilia) 108
- dingo, *see* domestic dog
- dolphin, species of Delphinidae (Delphinoidea, Cetacea) 93, 95–6, 102(n42), 263, 300(n43); *see also* bottle-nosed dolphin
- domestic cat, *Felis lybica domestica* (Felidae, Carnivora) 81, 118, 302(n78)
- domestic dog, captive and free-living *Canis familiaris* (Canidae, Carnivora), including dingo, pharia and Alaskan malamute 73, 75, 266–7, 300(n51, 53), 320, 341
- domestic fowl, *see* chicken
- domestic horse, *Equus caballus* (Equidae, Perissodactyla) 115–16
- domestic mouse, *Mus domesticus* (Muridae, Rodentia) 1, 2, 40, 71, 105–7, 111–2, 116, 117, 137(n1, n2), 199, 263–5, 299(n36), 335
- domestic pigeon, domesticated varieties of rock dove, *Columba livia* (Columbidae, Columbiformes) 75, 77, 127, 149, 178
- doves, small species of Columbidae (Columbiformes) 127; *see also* ringed turtle dove
- ducks, most of the smaller species of Anatidae (Anseriformes) 78, 127, 228; *see also* common eider; mallard; white-winged scoter
- dunnock, also called hedge-sparrow, *Prunella modularis* (Prunellidae, Passeriformes) 145–6, 302(n78)
- dwarf mongoose, *Helogale parvula* (Viverridae, Carnivora) 214, 252–3, 256
- eastern bluebird, *Sialia sialis* (Turdidae, Passeriformes) 207(n41, n52)
- elephant, *see* African elephant
- elephant seal, Northern elephant seal, *Mirounga angustirostris*, and Southern elephant seal, *M. leonina* (Phocidae, Pinnipedia) 143
- estrilid finches, also called weaver finches (Estrildidae, Passeriformes) 129, 296
- European bee-eater, *Merops apiaster* (Meropidae, Coraciiformes) 209–12, 214, 215, 217, 218
- European hedgehog, *Erinaceus europaeus concolor* (Erinaceidae, Insectivora) 63, 65–7, 70, 73, 75–6, 101(n1), 110, 139(n37), 326
- European minnow, *Phoxinus phoxinus* (Cyprinidae, Cypriniformes) 255
- ferret, *Mustela furo* (Mustelidae, Carnivora) 333
- fieldfare, *Turdus pilaris* (Turdidae, Passeriformes) 271
- finches, species of Fringillidae (Passeriformes) 23, 127; *see also* chaffinch, house finch
- fire-ants, *Solenopsis* spp. (Formicidae, Hymenoptera) 355
- Fisher's lovebird, *Agapornis personata fischeri* (Psittacidae, Psittaciformes) 308
- flycatchers (old world), species of Muscipidae (Passeriformes) 149; *see also* pied flycatcher; spotted flycatcher

- forest weaverbirds, *Malimbus* spp.
 (Ploceidae, Passeriformes) 309
- fruit-flies, *Drosophila* spp.
 (Drosophilidae, Diptera) 57, 58,
 318–19, 323
- gannets, *Sula bassana* (Sulidae,
 Pelecaniformes) 161, 168(n42)
- garden pea, *Pisum sativum*
 (Papilionaceae) 40, 41
- geese, species of Anserini (Anatidae,
 Anseriformes) 74, 79, 127, 145, 229;
 see also barnacle goose; greylag
 goose; lesser snow goose; snow
 goose
- gelada baboon, *Theropithecus gelada*
 (Cercopithecidae, Primates) 185
- gentoo penguin, *Pygoscelis papua*
 (Spheniscidae, Sphenisciformes)
 169(n67)
- giant panda, *Ailuropoda melanoleuca*
 (Procyonidae, Carnivora) 54
- gibbons, *Hylobates* spp. (Hylobatidae,
 Hominoidea) 159
- goats, *Capra* spp. (Bovidae, Artiodactyla)
 127, 194, 280, 322
- golden hamster, *Mesocricetus auratus*
 (Cricetidae, Rodentia) 138(n22)
- golden jackal, *Canis aureus* (Canidae,
 Carnivora) 220
- great tit, *Parus major* (Paridae,
 Passeriformes) 1, 2, 6, 34–6, 61(n1),
 77, 83, 92, 95, 97, 121, 122, 123,
 125–6, 139(n40), 152–3, 162, 171–3,
 178, 191, 193, 195, 204(n1), 294,
 325
- green woodhoopoe, *Phoeniculus pur-
 pureus* (Phoeniculidae,
 Coraciiformes) 220, 221–2, 229
- grey-breasted jay, *Aphelocoma
 ultramarina* (Corvidae,
 Passeriformes) 309
- greylag goose, *Anser anser* (Anatidae,
 Anseriformes) 117, 187
- grey parrot (African), *Psittacus erithacus*
 (Psittacidae, Psittaciformes) 93
- grey squirrel, *Sciurus carolinensis*
 (Sciuridae, Rodentia) 286
- ground beetle, *Carabus impressus*
 (Carabidae, Coleoptera) 66, 70
- guinea pigs, *Cavia* spp. (Caviidae,
 Rodentia, Mammalia) 114
- Gunnison's prairie dog, *Cynomys
 gunnisoni* (Sciuridae, Rodentia)
 139(n38)
- hamadryas baboon, *Papio hamadryas*
 (Cercopithecidae, Simiiformes,
 Primates) 227–8, 251, 256, 262, 270,
 272
- hamsters, species of Cricetidae
 (Rodentia, Mammalia) 114, 333
- hares, *Lepus* spp. (Leporidae,
 Lagomorpha) 114
- harvesting (harvester) ants, *Messor
 semirufus* (Myrmicinae,
 Formicidae) 63
- Hawaiian monk seal, *Monachus
 schauinslandi* (Phocidae,
 Pinnipedia) 242(n64)
- hedgehog, see European hedgehog
- hedge-sparrow, see dunnock
- hermit crab, *Clibanarius vittatus*
 (Paguroidea, Anomura, Decapoda,
 Crustacea) 350(n35)
- herring gull, *Larus argentatus* (Lariidae,
 Charadriiformes) 122
- honey-bee, *Apis mellifera* (Apidae,
 Hymenoptera) 179
- hooded seal, *Cystophora cristata*
 (Phocidae, Pinnipedia) 327–8
- horned grebe, *Podiceps auritus*
 (Podicipedidae, Podicipediformes)
 193
- horse, see domestic horse
- house finch, *Carpodacus mexicanus*
 (Fringillidae, Passeriformes) 152
- house martin, *Delichon urbica*
 (Hirundinidae, Passeriformes) 306,
 322
- hunting dog, also called African wild
 dog or Cape hunting dog, *Lycaon*

408 Index of species

- pictus* (Canidae, Carnivora) 55, 272
- hyena, brown hyena, *Hyaena brunnea*; striped hyena *H. hyaena*; spotted hyena *Crocuta crocuta* (Hyaenidae, Carnivora) 55, 272, 324
- ibex, *see* Nubian ibex
- Japanese macaque, sometimes called Japanese monkey, *Macaca fuscata* (Cercopithecinae, Cercopithecidae, Primates) 10, 97–9, 280, 285–6, 287, 302(n78), 366
- Japanese quail, *Coturnix japonica* (Phasianidae, Galliformes) 128, 155
- jays, *Garrulus* spp., in particular *G. glandarius* (Corvidae, Passeriformes) 149, 208; *see also* blue jay; grey-breasted jay; pinyon jay
- Jerusalem pine, *Pinus halepensis* (Pinaceae) 133–6, 137, 311, 339
- jumping spiders (araneophagic), *Portia* spp. (Salticidae, Araneae) 101(n2)
- kangaroo rats, *Dipodomys* spp. (Heteromyidae, Rodentia) 122, 123
- killer whale, *Orcinus orca* (Delphinidae, Cetacea) 282
- kingfishers, species of Alcedinidae (Coraciiformes) 119, 208; *see also* pied kingfisher
- kittiwake, *Rissa tridactyla* (Laridae, Charadriiformes) 161, 168(n42), 169(n66)
- klipspringer, *Oreotragus oreotragus* (Bovidae, Artiodactyla) 271
- koala, *Phascolarctos cinereus* (Phascolarctidae, Marsupialia, Mammalia) 114–15, 310
- langur monkey, *Semnopithecus* spp. 178
- lemmings, species of Lemmini (Microtinae, Muridae, Rodentia) 265
- lesser snow goose, *Anser caerulescens caerulescens* (Anatidae, Anseriformes) 127, 230
- lion, *Panthera leo* (Felidae, Carnivora) 55–6, 81, 118, 123, 272, 324
- lovebirds, *Agapornis* spp. (Psittacidae, Psittaciformes) 308; *see also* Fisher's lovebird; peach-faced lovebird
- Macgregor's gardener bower-bird, *Amblyornis macgregoriae* (Ptilonorhynchidae, Passeriformes) 302(n92)
- mallard, *Anas platyrhynchos* (Anatidae, Anseriformes) 230
- marmosets, *Callithrix* spp. (Callitrichidae, Simiiformes) 208
- marsh tit, *Parus palustris* (Paridae, Passeriformes) 88, 167(n22)
- marsh warbler, *Acrocephalus palustris* (Sylviidae, Passeriformes) 83
- martial eagle, *Polemaetus bellicosus* (Accipitridae, Falconiformes) 121, 246, 255
- Mauritius kestrel, *Falco punctatus* (Falconidae, Falconiformes) 280, 307
- meadow vole, *Microtus pennsylvanicus* (Muridae, Rodentia) 234, 236
- medium ground finch, *Geospiza fortis* (Geospizinae, Emberizidae, Passeriformes) 129
- meerkat (slender-tailed), also called suricate, *Suricata suricatta* (Herpestinae, Viverridae, Carnivora) 214, 243–7, 249, 250, 255, 256, 257, 258, 271, 272, 278, 279, 298(n1)
- mice, *Mus* spp. (Muridae, Rodentia) 114, 260; *see also* domestic mouse
- mistle thrush, *Turdus viscivorus* (Turdidae, Passeriformes) 294, 303(n106)
- Mongolian gerbil, *Meriones unguiculatus* (Muridae, Rodentia) 114, 138(n22), 199, 201

- mongoose, species of Viverridae (Carnivora) 81, 208, 252, 254; *see also* dwarf mongoose; meerkat
- moorhens, *Gallinula* spp. (Rallidae, Gruiformes) 193
- mountain gazelle, *Gazella gazella* (Bovidae, Artiodactyla) 262
- mountain sheep, bighorn sheep, *Ovis canadensis*, and thinhorn sheep *O. dalli* (Bovidae, Artiodactyla) 262, 280
- mouse, *see* domestic mouse
- moustached warbler, *Acrocephalus melanopogon* (Sylviidae, Passeriformes) 240(n23)
- naked mole rat, *Heterocephalus glaber* (Bathyergidae, Rodentia) 256, 275
- nightingale, *Luscinia megarhynchos* (Turdidae, Passeriformes) 88, 89, 102(n42), 144, 179
- northern fur seal, *Callorhinus ursinus* (Otariidae, Pinnipedia) 122
- Norway rat, *see* brown rat
- Nubian ibex, *Capra ibex nubiana* (Bovidae, Artiodactyla) 262
- oribi, *Ourebia ourebi* (Bovidae, Artiodactyla) 271
- osprey, *Pandion haliaetus* (Pandionidae, Falconiformes) 149, 259–60
- ostrich, *Struthio camelus* (Struthionidae, Struthioniformes) 226, 228, 236, 271
- otter, species of Lutrinae (Mustelidae, Carnivora) 81
- oyster-catcher, *Haematopus ostralegus* (Haematopodidae, Charadriiformes) 74, 214, 327
- Pacific salmon, *Oncorhynchus* spp. (Salmonidae, Salmoniformes) 79, 90, 122
- Palestine mole rat, also called blind mole rat, *Spalax ehrenbergi* (Spalacidae, Rodentia) 333–4
- Palestine sunbird, *Nectarinia osea* (Nectariniidae, Passeriformes) 11
- palm swift, Antillean palm swift, *Tachornis phoenicobia* (Apodidae, Apodiformes) 307
- panda, *see* giant panda
- peach-faced lovebird, *Agapornis roseicollis* (Psittacidae, Psittaciformes) 308
- peacock, male of the common peafowl, *Pavo cristatus* (Phasianidae, Galliformes) 143–44, 179
- pharia, *see* domestic dog
- pie flycatcher, *Ficedula hypoleuca* (Muscicapidae, Passeriformes) 126, 193
- pie kingfisher, *Ceryle rudis* (Alcedinidae, Coraciiformes) 217, 229
- pigeons, *see* domestic pigeon, wood-pigeon
- pig-tailed macaques, *Macaca nemestrina* (Cercopithecidae, Primates) 196, 233
- pikas, *Ochotona* spp. (Ochotonidae, Lagomorpha) 114
- pike, *Esox lucius* (Esocidae) 298–9(n20)
- pine, *see* Jerusalem pine
- pink-backed pelican, *Pelecanus rufescens* (Pelecanidae, Pelecaniformes) 178
- pinyon jay, *Gymnorhinus cyanocephalus* (Corvidae, Passeriformes) 164, 170(n76), 193, 216, 223, 235, 242(n72)
- polecat (European), *Mustela putorius* (Mustelidae, Carnivora) 118
- prairie dogs, *Cynomys* spp. (Sciuridae, Rodentia) 270
- prairie vole, *Microtus ochrogaster* (Muridae, Rodentia) 234–5, 236
- pygmy white-toothed shrew, *Suncus etruscus* (Soricidae, Insectivora) 311
- rats, *Rattus* spp. (Muridae, Rodentia),

410 Index of species

- 91, 93, 114, 207(n53), 260; *see also* black rat; brown rat
- ravens, *Corvus* spp. (Corvidae, Passeriformes) 88, 102(n42); *see also* common raven
- red deer, *Cervus elaphus* (Cervidae, Artiodactyla) 262, 271
- red fox, *Vulpes vulpes* (Canidae, Carnivora) 10, 23, 24, 88
- red squirrel, *Sciurus vulgaris* (Sciuridae, Rodentia) 124
- red-winged blackbird, *Agelaius phoenicurus* (Icteridae, Passeriformes) 83
- rhesus monkey, also called rhesus macaque, *Macaca mulatta* (Cercopithecidae, Primates) 196–8, 203, 223, 233
- rifleman, *Acanthisitta chloris* (Xenicidae, Passeriformes) 217, 233
- ringed turtle dove, *Streptopelia risoria* (Columbidae, Columbiformes) 168(n42)
- robin (European), *Erithacus rubecula* (Turdidae, Passeriformes) 149
- sage grouse, *Centrocercus urophasianus* (Tetraonidae, Galliformes) 167(n6)
- Seychelles warbler, *Acrocephalus sechellensis* (Sylviidae, Passeriformes) 214
- sheep, *Ovis* spp. (Bovidae, Artiodactyla) 127, 196, 280
- shrews, species of Soricidae (Insectivora, Mammalia) 114; *see also* pygmy white-toothed shrew
- shrikes, species of Laniidae (Passeriformes, Aves) 159
- Siberian tit, *Parus cinctus* (Paridae, Passeriformes) 89
- silver-backed jackal, *Canis mesomelas* (Canidae, Carnivora) 220, 244, 278
- singing honeyeater, *Meliphaga virescens* (Meliphagidae, Passeriformes) 293
- slave-making ant, *Polyergus lucidus* (Formicidae, Hymenoptera) 355–6
- snow goose, *Anser caerulescens* (Anatidae, Anseriformes) 127, 230
- sparrowhawk, *Accipiter nisus* (Accipitridae, Falconiformes) 123, 139(n40)
- sperm whale, *Physeter catodon* (Physeteridae, Cetaceae) 6, 282
- spider monkey, *Ateles geoffroyi* (Cebidae, Primates) 194
- spotted flycatcher, *Muscicapa striata* (Muscicapidae, Passeriformes) 182–3
- squirrels, *see* African ground squirrel; grey squirrel; red squirrel
- starling (European), *Sturnus vulgaris* (Sturnidae, Passeriformes) 83, 88, 93, 119, 162, 322, 347(n1)
- stripe-backed wrens, *Campylorhynchus nuchalis* (Troglodytidae, Passeriformes) 281
- summer tanager, *Piranga rubra* (Thraupidae, Passeriformes) 153
- superb fairywren, also called superb blue wren, *Malurus cyaneus* (Maluridae, Passeriformes) 222
- swallow, also called barn swallow, *Hirundo rustica* (Hirundinidae, Passeriformes) 362; *see also* cliff swallow; house martin
- swamp sparrow, *Melospiza georgiana* (Emberizidae, Passeriformes) 83
- tiger, *Panthera tigris* (Felidae, Carnivora) 81, 118
- tits, species of Paridae (Passeriformes) 88; *see also* blue tit; coal tit; great tit; marsh tit; Siberian tit
- tsetse flies, *Glossina* spp. (Glossinidae, Diptera) 354, 369(n7)
- vampire bats, species of Desmodontidae (Chiroptera) 214, 220–1, 239(n14), 240(n33)
- Verreaux's eagle, *Aquila verreauxii* (Falconiformes) 175, 179, 192
- vervet monkeys, *Cercopithecus aethiops*

- (Cercopithecidae, Primates) 121,
 194, 198, 203, 259
- village weaver-bird, *Ploceus cuculatus*
 (Ploceinae, Ploceidae, Passeriformes)
 80–1, 307–9
- Vogelkop gardener bower-bird,
Amblyornis inornatus
 (Ptilonorhynchidae, Passeriformes)
 76, 283, 302(n92), 309, 364
- voles, *Microtus* spp. (Cricetidae,
 Rodentia), see meadow vole; prairie
 vole
- wandering albatross, *Diomedea exulans*
 (Diomedidae, Procellariiformes)
 161
- white-crowned sparrow, *Zonotrichia leu-
 cophrys* (Emberizidae,
 Passeriformes) 153
- white-fronted bee-eater, *Merops bullock-
 oides* (Meropidae, Coraciiformes)
 218–19, 220, 222, 225, 240(n27),
 270, 309
- white-tailed deer, or Virginian deer,
Odocoileus virginianus (Cervidae,
 Artiodactyla) 194
- white-winged chough, *Corcorax
 melanorhamphos* (Grallinidae,
 Passeriformes) 214, 218, 224, 226,
 236, 241(n48), 275
- white-winged scoter, *Melanitta fusca*
 (Anatidae, Anseriformes) 242(n64)
- whydahs, species of Viduinae (Ploceidae,
 Passeriformes) 129, 296
- wolf, *Canis lupus* (Canidae, Carnivora)
 102(n42), 250, 251, 253, 254, 256,
 266–7, 272, 300(n53), 337
- wood-pigeon, *Columba palumbus*
 (Columbidae, Columbiformes) 271
- yellow baboon, also called chacma or
 olive baboon, *Papio cynocephalus*
 (Cercopithecidae, Primates) 185
- yellow cobra, also called cape cobra,
Naja nivea (Elapidae, Serpentes)
 246–7, 255, 271
- zebra, *Equus* spp., African Equidae
 (Perissodactyla) 55–6, 192
- zebra finch, *Poephila (Taeniopigia) gut-
 tata* (Estrildidae, Passeriformes) 80,
 205(n19), 230

Index of subjects

- Ables, E. D. 300(n57)
 acquired characters 19–21, 24, 30, 31;
 see also animal traditions; cultural
 evolution
 behavioural 20, 314
 in Darwin's heredity theory 30, 314
 adaptations 54–60, 130
 and constraints 57–8, 288, 305–6,
 360
 and inheritance systems 58–60
 evolutionary explanations of 54
 multiple functions of 55–7
 Adolphs, R. 101(n10)
 adoption 208, 209, 212, 225–31, 237
 and ecological compatibility 228, 229
 and evolutionary conflict 226
 and family size 226, 228, 230, 231
 and sexual imprinting 229–31,
 242(n56)
 biasing mate preference 227–31,
 242(n56)
 by replacement males 229
 compared with helping 225–6, 231
 cultural spread of behaviour through
 232–6, 242(n64)
 enforced 226–8, 235–6, 241(n48)
 initiated by adoptee 226
 non-adaptive explanations of 226
 origin of 236–7
 through active kidnapping 226–8
 through brood amalgamation 226,
 228, 241(n52)
 Aisner, R. 133, 134, 140(n66), 350(n36)
 alarm calls 67, 120, 121, 139(n38, 40),
 223, 244, 247, 255–6, 271
 Albon, S. D. 300(n41, n65)
 Alcock, J. 138(n11)
 Alexander, A. J. 115, 139(n24)
 Alexander, R. D. 224, 241(n43), 302(n75)
 alloparental care, 137(n2), 208–9,
 213–14, 231–2, 238; *see also*
 adoption; helping
 adaptive explanation of 213–31,
 238
 and sexual imprinting 229–31, 238
 as a parental style 231–2, 234–6, 237,
 238
 cultural spread of behaviour patterns
 through 232–9
 non-adaptive explanation of 213
 origins of 213, 236–7
 Altmann, J. 205(n16)
 Altringham, J. D. 239(n14), 240(n33)
 altruistic behaviour 176–7, 208, 213,
 220, 223, 224, 239, 273, 275,
 301(n73); *see also* adoption;
 alloparental care; helping
 Amundsen, T. 206(n32)
 Anderson, J. R. 299(n28)
 Andersson, M. 166(n4), 168(n27)
 animal–human continuity of mind
 352–3, 364, 365, 369(n1)
 animal traditions 11, 18, 23, 24, 31,
 95–100, 132, 263, 277–89, 353; *see*
 also cultural evolution; habits
 and adaptation to genotypes 12–3,
 287–8, 297
 and behavioural inertia 280
 and conservation 267–8, 354
 and dialects 6, 21, 95, 99, 281–3
 and genetic hitchhiking 282
 and group selection 277
 and learnt life styles 24, 67, 124, 198,
 200, 201, 236, 268, 278–9, 280, 284,
 285, 302(n78, n86); *see also* behav-
 ioural package, life styles in animal
 societies
 and memes 357–9
 and niche construction 286–8, 353
 and selection of congruent genetic

- variations 136, 237, 238, 284, 289, 317; *see also* genetic assimilation
- and speciation 130, 289, 296, 297, 339
- cumulative evolution of 21, 23–4, 94, 97, 99, 136, 284, 364
- development of 4–5, 23–4, 30, 95, 97, 98, 99, 124, 134–5, 201–2, 237–8, 263, 279, 285–9, 297
- formed through alloparenting, 232–8; *see also* alloparental care
- in black rats 133–4
- in bowerbirds 282–4, 302(n92), 364
- in chimpanzees 23, 96, 279–80, 285
- in Japanese macaques 10, 97–9, 103–4(n67), 280, 285–6
- in tarbutniks 3–5, 12–13, 279, 287
- in terrestrial insects 354–7
- in tits 36, 92, 99
- in voles 234–6, 237
- in whales 6, 281–2
- persistence of 134–6, 280, 297
- prevalence of 97, 100
- vocal 6, 21, 281–2
- within family groups 95–6, 121, 132–7, 160, 198, 201–2; *see also* alloparental care; parental transmission
- within non-kin social groups 278–289, 297
- Apfelbach, R. 139(n28)
- Arabian babbler
 - functions of altruistic behaviour in 216–17, 240(n22)
 - reproductive suppression in 256
- Aristotle 45, 254, 255, 298(n13)
- Armstrong, E. A. 169(n57)
- Aronson, L. 300(n41)
- Arrowood, P. C. 169(n58)
- Asch, S. E. 248, 298(n2), 369(n1)
- Ashmole, N. P. 239(n14)
- asocial (individual, trial-and-error)
 - learning 67–8, 80–1, 100, 117, 133, 316, 325–7
 - in hedgehogs 65–6, 67
 - of birdsong 81–5
- assimilate–stretch principle 330–3
- Atlan, H. 62(n16)
- Avery, M. I. 240(n25)
- Avital, E. 32(n15), 101(n1, n15), 137(n1), 140(n65), 204(n1), 239(n5), 241(n47, n53), 242(n61, n62, n64), 298(n1)
- baboons 178, 185, 227–8, 251, 256, 270, 272, 361
- Baddeley, A. D. 103(n55)
- Badyaev, A. V. 347(n3)
- Bagemihl, B. 302(n84)
- Baine, D. 102(n20, 21)
- Baker, A. J. 303(n102)
- Baker, M. C. 168(n38), 293, 303(n101)
- Baker, R. R. 140(n48), 299(n22)
- Balda, R. P. 170(n76), 206(n35), 216, 223, 240(n18), 241(n40), 242(n70)
- Baldwin effect 317
- Baldwin, J. M. 317
- Balph, D. F. 138(n15)
- Baptista, L. F. 139(n44), 303(n102)
- Barbault, R. 300(n56)
- Barker, D. J. P. 369(n17)
- Barrett, L. 205(n16)
- Bateson, G. 53, 62(n18)
- Bateson, P. P. G. 28, 33(n23), 102(n33), 128, 140(n60), 155, 168(n48), 181, 205(n12, n13), 207(n39), 303(n108)
- Beauchamp, G. 241(n49, n52)
- beauty 85, 102(n42)
- Beck, B. B. 300(n56)
- Beck, M. 139(n25)
- Beecher, M. D. 167(n17)
- bee-eaters 209–12, 214, 215, 217, 218–20, 222, 225, 240(n27), 270, 309
- Beer, A. E. 138(n18)
- Beer, C. G. 167(n17)
- Begon, M. 348(n12)
- behavioural inheritance systems 6, 11, 59, 60, 63, 68, 353, 357
- behavioural package 17, 18, 22, 24, 29, 95, 99, 148, 292, 297, 302–3(n96), 344, 362
- behavioural plasticity, *see* plasticity, behavioural

414 Index of subjects

- behavioural transmission, *see* animal traditions; cultural evolution
- behavioural transmission as developmental reconstruction 26–8, 29, 59, 60, 237–8, 357–60
- Beissinger, S. R. 206(n28)
- Bell, W. J. 369(n6, n16)
- Bengtsson, H. 204(n1)
- Benus, R. F. 242(n71)
- Bergstrom, C. T. 205(n10)
- Berman, C. M. 140(n64), 198, 207(n46), 242(n65, n66), 302(n84)
- Bernays, E. A. 369(n11)
- Berry, R. J. 137(n1)
- Bertram, B. C. R. 241(n49, n51), 300(n58)
- Bhatia, M. S. 205(n21)
- Billingham, R. E. 138(n18)
- birdsong 27, 34–5, 82–5, 102(n39), 125, 126–7, 153–4, 195, 281–2, 304, 347(n1)
- auditory feedback 84, 85
- dialects 83, 95, 99, 126–7, 153–4, 281
- evolution through genetic assimilation 321–2
- evolution through the assimilate–stretch principle 333
- imprinting 80, 83, 153, 292–3
- song template 84
- Birkhead, T. R. 61(n2), 167(n10, n20)
- Black, J. M. 167(n12), 168(n40, n43, n45, n47), 169(n63, n66), 170(n70), 242(n54)
- blackbird (European) 82, 83, 102(n42), 206(n29)
- black rat, cultural transmission in 133–6, 137, 339–40
- Blackmore, S. 32(n19)
- Boakes, R. 102(n30)
- Boitani, L. 300(n52)
- Boness, D. J. 239(n3), 349(n26)
- Bonner, J. T. 18, 32(n14)
- Bost, C. A. 169(n67)
- Boutin, S. 140(n49)
- Bowen, W. D. 349(n26)
- bower-birds 76–7, 125, 283, 284, 286–7, 302(n92), 309, 339, 353, 364
- bower building 76–7, 102(n26), 125, 282–4, 302(n92), 309, 339, 364
- Box, H. O. 32(n14)
- Boyd, R. 15, 32(n13), 242(n63), 276, 277, 302(n76, 77), 349(n23, 27)
- Bradbury, J. W. 167(n6)
- Bradley, J. S. 169(n55)
- Breed, M. D. 369(n16)
- Breedlove, S. M. 101(n8)
- Breitwisch, R. 207(n52)
- Bridges, R. S. 207(n51)
- Brooke, M. 61(n2), 167(n20)
- Brosset, A. 348(n9)
- Brower, L. 102(n37)
- Brown, C. R. 299(n33)
- Brown, E. D. 169(n62), 298(n10)
- Brown, J. L. 168(n49), 239(n11), 240(n15)
- Brown, L. H. 204(n6)
- brown rat 11, 69, 71, 76, 116, 194, 233, 263, 310, 333, 336
- maternal care 198–9, 201
- musical preferences 75
- Brush, A. H. 168(n31, 36)
- Buchholz, R. 300(n54), 369(n3)
- Burke, V. E. 204(n6)
- Burley, N. 169(n51)
- Burns, K. J. 347(n3)
- Burton, M. 101(n1)
- Byrne, R. 103(n61)
- Cacioppo, J. T. 298(n12)
- Caldji, C. 62(n21)
- Calhoun, J. B. 263, 264, 265, 300(n44)
- Call, J. 207(n53)
- Camanni, S. 169(n57)
- canalisation 50
- Carlstead, K. 101(n11)
- Caro, T. M. 102(n38), 139(n31)
- carotenoids 151–3
- Catchpole, C. K. 102(n39, 41), 103(n51), 140(n53, 56), 168(n39), 302(n87)
- categorisation 73–5, 77, 100, 257, 336

- cattle, domestication of 13–15, 28, 340, 350(n34)
- Cavalli-Sforza, L. L. 15, 32(n13), 232, 242(n63), 349(n23)
- Cézilly, F. 169(n55)
- Chapais, B. 140(n50)
- Chapman, C. A. 207(n40)
- Chapman, L. J. 207(n40)
- Chapman, R. F. 369(n11)
- Chardine, J. W. 168(n42), 169(n66)
- Cheney, D. L. 121, 139(n39), 299(n21)
- chimpanzee (common), traditions in 23, 96, 279–80, 285, 302(n78)
- Choe, J. C. 369(n4)
- Choudhury, S. 168(n40), 241(n52), 242(n54)
- Cincotta, R. P. 138(n16)
- Ciucci, P. 300(n52)
- Clark, L. 139(n36)
- Clark, M. M. 138(n22), 199, 207(n50)
- Clayton, D. H. 139(n34)
- Clemmons, J. R. 300(n54), 369(n3)
- Clobert, J. 169(n67)
- Clutton-Brock, T. H. 111, 138(n10, 12), 167(n13), 168(n24), 169(n52), 204(n5), 205(n12), 206(n36), 240(n35), 241(n38), 298(n1), 299(n26, n31), 300(n40, n65)
- co-evolution
- of genes and culture 13–15, 31, 140(n67), 287–8, 340–1, 350(n34), 365–7
 - of genes and language 365–7
 - of genes and learning, *see* learning-evolution
 - of hosts and parasites 129, 140(n62), 296
 - of mates, *see* male–female conflict; male–female co-operation
 - of parents and offspring 174, 180, 202, 207(n53); *see also* parent–offspring conflict
 - of sociality and the brain 337–8, 345–6, 350(n40)
- Cockburn, A. 225, 239(n11), 240(n17, 30), 241(n36, 46)
- Cody, M. 101(n15)
- Collias, E. C. 102(n36), 302(n81), 307, 348(n4, 6)
- Collias, N. E. 102(n36), 302(n81), 307, 348(n4, 6)
- Collins, A. 299(n38)
- Colwell, D. D. 299(n36)
- common raven, information sharing by 260–1, 273
- communication, *see* information sharing
- Conover, M. R. 299(n21)
- Coombs, C. J. F. 168(n41)
- Cooke, F. 140(n59), 242(n58)
- co-operation 141, 147, 156–7, 177, 208, 221–1, 222–3, 272–3, 300–1(n68), 301(n69); *see also* adoption; alloparental care; helping; group organisation; kin selection; male–female co-operation; punishment
- and group life cycles 241(n45)
 - no-cost 157, 164, 224
- co-operative breeding, *see* alloparental care
- coprophagy 114–16, 354
- Corkin, S. 102(n43)
- courtship feeding 148–51, 156, 163, 167(n21), 210, 211, 214
- and information 150–1
 - and helping 210, 214, 221
- Cowie, R. J. 103(n53)
- Craig, J. L. 239(n10)
- Cramp, S. 101(n1)
- Crespi, B. J. 369(n4)
- Crook, J. H. 300(n63)
- Cross, H. A. 102(n25)
- Crowcroft, P. 137(n1)
- Cucco, M. 169(n57)
- cultural adaptations 21, 94; *see also* cultural evolution, cumulative
- cultural evolution 5–6, 12, 13, 16–17, 21, 27, 94–5, 232, 238–9, 248, 277, 284, 296–7, 367–8; *see also* animal traditions
- and adaptation to genotypes 365

416 Index of subjects

- cultural evolution (*cont.*)
 and adaptive radiations 289, 341
 and behavioural 'drive' 289
 and behavioural inertia 280, 367–8
 and hybridisation 295
 and imprinting 128–9, 229–31, 293–6
 and memes 26–7, 358–9
 and speciation 6, 130, 289–96, 297, 339
 cumulative 21, 23–4, 94, 97, 99, 136, 284, 364
 diffusion and drift in 281
 effects on genetic evolution 136, 237, 238, 284, 289, 339–341, 346; *see also* genetic assimilation; habits
 guiding hominid evolution 363–4, 367
 in humans 11, 13–15, 17, 21–3, 349(n34), 362–8
 in tarbutniks 3–5, 12–13, 279–80
 of literacy 362–4
 phases of 285–6
 role in the evolution of language 365–7
 symbol-based 21–2, 364, 365–7, 368
 technological 21, 25
 through alloparenting 232–3, 238–9, 364
 cultural inheritance 6, 8, 16, 31, 99, 134, 198, 231, 232, 366
 as developmental reconstruction 26–8, 29, 59, 60, 237, 357–60, 367
 compared with genetic transmission 16, 135, 357–8
 through niche-construction 286–7, 353
 cultural package, *see* behavioural package
 cultural speciation 6, 130, 289–96, 297, 303(n105), 339; *see also* speciation
 cultural transmission, *see* cultural inheritance
 culture 11, 21–2, 24–5; *see also* cultural evolution
 and determinism 367–8
 definition 22
 linguistic 364, 367–8
 symbolic 21–2, 353, 359, 365–7, 368
 Cunningham, M. A. 168(n38)
 Cunningham, R. B. 204(n17)
 Curio, E. 299(n21), 300(n61)
 Cuthill, I. 170(n71)
 Daan, S. 167(n22)
 Dale, S. 140(n55), 206(n32)
 Damasio, A. R. 101(n10)
 Darling, F. F. 300(n65)
 Darwin, C. 1, 29, 30, 102(n42), 292, 304, 311, 314, 315, 335, 347(n3), 348(n10, n13, n14), 352, 354, 364, 369(n1), 269(n2, n10)
 Darwinian evolution by natural selection 2, 3, 19, 20, 30–1, 51, 136, 315
 Darwinism 1–2, 19, 20
 gene-centered 1–2, 21, 357
 Lamarckian 19, 314–15; *see also* Lamarckian evolution
 universal 51
 Darwin's heredity theory 30, 51, 61(n12), 315, 348(n14)
 Dasmann, R. F. 300(n64)
 Davey, G. 101(n14)
 Davies, N. B. 167(n14), 182, 205(n15), 302(n78)
 Davis, L. S. 169(n67)
 Dawes, R. M. 301(n68)
 Dawkins, R. 7, 25, 28, 30, 32(n5, n21), 43, 44, 51, 61(n7, n11), 145, 167(n11), 301(n72), 358
 De Groot, P. 299(n33)
 de Vries, J. 168(n42)
 De Waal, F. B. M. 302(n78)
 Deacon, T. 369(n20, n23)
 Demeter, L. 302(n74)
 Demong, N. J. 240(n28, n35)
 Dennett, D. C. 32(n19)
 development–evolution continuity 26–9, 59, 60, 237–8, 357–60
 developmental approach to behavioural evolution 28–9, 357–60

- dialects 96, 99, 281–2
 and genetic hitchhiking 282
 in birds 83, 95, 99, 126–7, 153–4, 281
 in whales 6, 281–2
- Diamond, J. 102(n26), 282, 284, 302(n91)
- Dilger, W. C. 348(n8)
- dispersal 123, 201, 207(n52), 215, 216, 225, 262–3, 278, 342, 344
- dogs, *see* domestic dog
- Dolan, R. J. 101(n10)
- domestic dog 73, 75, 266–7, 300(n51, n53), 320, 341
- domestic mouse 1, 2, 40, 57–8, 71, 111–12, 116, 117, 137(n1, n2), 299(n36), 335
 maternal care in 105–7, 156–7, 199
 social death 263–5
- domestication 265–7, 341
 and brain size 266
 and breakdown of sustainable social organisation 265–7
 genetic and cultural selection for 267
 of the dog 266–7, 300(n53)
 through genetic assimilation of changed habits 341
- Donald, M. 366, 369(n22)
- Doolan, S. P. 240(n15), 298(n1), 299(n23), 302(n79)
- Doron, N. 349(n32)
- Drummond, H. 204(n3)
- Ducker, G. 298(n1)
- Dudai, Y. 101(n3, n4)
- Dugatkin, L. A. 167(n6), 168(n49)
- Dunbar, P. 205(n16)
- Dunbar, R. I. M. 205(n16), 349(n33)
- Dunn, P. O. 240(n30), 241(n36)
- Duquette, M. 139(n35)
- Durham, W. H. 13, 15, 32(n11, n13), 350(n34)
- Eadie, J. McA. 206(n34), 241(n49, n52), 242(n55)
- ecological legacies 124, 225, 342, 355, 356; *see also* niche construction
- Eden, S. F. 206(n33)
- Edmunds, M. 348(n21)
- Eens, M. 347(n1), 348(n19)
- Ehrlich, P. R. 168(n40), 206(n30)
- Emlen, J. T., Jr. 349(n30)
- Emlen, S. T. 218, 219, 239(n2, n8), 239(n11), 240(n26, n27, n28, n35)
- emotional contagion 254–6, 257, 298(n16, n18), 298–9(n20), 299(n27)
- Enstrom, D. A. 169(n51)
- Erickson, C. J. 168(n42)
- Ernst, U. 299(n21)
- Eshel, I. 205(n9)
- Estes, R. D. 139(n32), 298(n1, n7), 300(n62, n65)
- Evans, C. S. 139(n38)
- Evans, L. D. 369(n16)
- Evans, P. G. H. 300(n43)
- evolutionary conflict 142, 174, 175, 179, 180–2, 191, 202; *see also* male–female conflict; parent–offspring conflict; sibling rivalry
 and arms races 142, 143, 144, 174, 188
- evolutionary psychology 9, 32(n7), 288, 360
- Ewer, R. F. 62(n20), 115, 139(n23, n29), 298(n1, n7), 311, 319–20, 341, 348(n11), 348(n18)
- extra-parental care, *see* alloparental care
- Fabre, J. H. 64, 100(n1)
- Fairbanks, L. A. 140(n64), 205(n17, n20), 207(n47, n56), 242(n65), 302(n84)
- Farabaugh, S. M. 169(n57, n60)
- Fedigan, L. M. 207(n43)
- Feldman, H. N. 302(n78)
- Feldman, M. W. 15, 32(n13), 33(n26), 205(n9), 232, 242(n63), 349(n23), 350(n34)
- female choice 125, 143–5
 and attractiveness 144
 and ecological preferences 126–7, 145, 150, 151

418 Index of subjects

- female choice (*cont.*)
 and good genes 125–6, 144, 155; *see also* handicap principle
 and imprinting 126, 127–30
 and male colouration 151–3
 and male song 83, 125–6, 127, 153–4
 and paternal care 141, 150, 151
 in lekking species 143–4, 167(n6)
 of middle-aged males 158–9, 169(n51)
 through courtship feeding 148–51, 167(n21)
- Ferguson, R. S. 206(n32)
- Ferrière, R. 241(n43)
- Fessl, B. 240(n23)
- fish 79, 90, 122, 255, 298–9(n20)
- Fisher, R. A. 144, 167(n9)
- fitness 2, 31(n1), 51, 108, 142–3, 157, 228(n2), 181, 182, 204, 220
 inclusive 176, 177, 178, 187, 191, 202, 204, 204(n4), 213, 218, 220
 non-additive 164
 relative 31(n1)
- Fitzpatrick, J. W. 140(n49)
- Fleming, A. S. 207(n53)
- Fodor, J. A. 32(n8), 369(n18)
- Foelix, R. F. 100(n1)
- food hoarding 35–6, 87, 88–9, 103(n52), 311
- Forbes, L. S. 205(n11, 12), 207(n38)
- Ford, J. K. B. 302(89)
- Forester, D. J. 300(n57)
- Forslund, P. 140(n49), 169(n52)
- Fox, C. W. 138(n8), 349(n29)
- Fox Keller, E. 33(n23), 205(n14)
- Frank, H. 300(n53)
- Frank, M. G. 300(n53)
- Freeberg, T. M. 140(n54)
- Freud, S. 299(n27)
- Fry, C. H. 239(n5)
- Galea, L. A. M. 299(n36)
- Galef, B. G., Jr. 32(n14, n18), 103(n57, n59, n67), 138(n15, n22), 139(n25), 207(n50), 299(n33), 302(n84)
- Garcia, J. 78, 101(n12), 102(n29), 336
- Geertz, C. 61(n8)
- Geist, V. 300(n41), 302(n82, n83)
- Gelfand, D. L. 139(n38)
- generalisation 74–77, 100, 121, 257
 of responses 75, 102(n20), 336–7, 338
 of stimuli 74, 77, 324, 336, 338
- genetic assimilation 317–25, 330–38
 and evolution of ‘instincts’ 317–25, 346
 and lengthening of behaviour sequences 330–3
 and runaway selection for better learning 335–6, 337–8, 367
 and switching perceptual modalities 330, 333–5
 and the assimilate–stretch principle 330–3
 conditions conducive to 322–3, 348–9(n22)
 effects of tradition on 325
 experiments with fruit-flies 318–19, 348(n15)
 genetic model of 318–19, 348(n16)
 in human evolution 364, 365–6
 in the evolution of language 365–7
 in the evolution of nest-building 330–3
 in the Palestine mole rat 333–5
 leading to evolution of categories and rules 335–7
 of cognitive compatibility with mother 344–5
 of filial imprinting 316, 320
 of morphology and behaviour 320, 333–4, 338–41, 350(n35)
 of nest building 323–4
 of olfactory imprinting 320–1
 of predator avoidance 324
 of sex-differences 342–6
 of the innate components in birdsong 321–2
- genetic constraints 82; *see also* adaptation and constraints
- genetic diseases 39–40, 41
- genetic inheritance, *see* inheritance systems, genetic

- genomic imprinting 188–90, 205(n22, n23, n24), 206(n25)
 and cognitive compatibility with mother 344–5, 350(n40)
 and timing of weaning 189–90
 as division of labour 350–1(n41)
 as evolutionary conflict 188, 350–1(n41)
 genotype and phenotype 43–51, 60; *see also* plasticity
 Gibson, K. R. 32(n14)
 Gibson, R. M. 167(n6)
 Gigerenzer, G. 369(n18)
 Gilbert, A. N. 204(n2)
 Gill, S. B. 168(n46), 169(n50), 239(n14)
 Gill, T. J. 138(n18)
 Ginzburg, L. R. 300(n47)
 Giraldeau, L. A. 101(n16)
 Godden, D. 103(n55)
 Godfray, H. C. J. 204(n5, 7), 205(n8, n9)
 Goldsmith, T. H. 168(n33)
 Gomendio, M. 207(n42, n45)
 González-Mariscal, G. 207(n53)
 Goodloe, L. 369(n14)
 Goodnight, C. J. 301(n70)
 Goodwin, T. W. 168(n30, n31)
 Gordens, H. 348(n15)
 Gori, D. F. 299(n33)
 Gorman, M. L. 168(n41)
 Gosler, A. 61(n1), 102(n27), 168(n29), 170(n69), 204(n1)
 Gosling, L. M. 300(n67)
 Gottlander, K. 206(n32)
 Gottlieb, G. 102(n33), 302–3(n96)
 Gould, C. G. 102(n26), 302(n91)
 Gould, E. 101(n5)
 Gould, J. L. 102(n26), 302(n91)
 Gowaty, P. A. 167(n15)
 Grant, B. R. 84, 102(n40), 128–9, 140(n61), 295, 303(n109)
 Grant, P. R. 84, 102(n40), 128–9, 140(n61), 295, 303(n109)
 Gray, R. D. 28, 33(n23)
 great tit 1, 2, 23, 26, 61(n1), 77, 97, 191, 204(n1), 294,
 alarm calls 121, 122
 foraging 35, 139(n40), 152–3, 325
 interactions within the family 171–3, 178, 193, 195
 song 34–5, 83, 125–6
 traditions in 36, 92, 96, 99
 Green, D. J. 167(n19)
 Green, S. 302(n94)
 Greene, E. 299(n33, n34)
 Greenwood, P. 139(n41, n42)
 Griesemer, J. 28, 33(n23)
 Griffin, D. R. 369(n1)
 Griffiths, P. 28, 33(n23)
 Groothuis, T. 169(n51)
 group evolution 243, 248, 256, 269–73, 337–8
 and dialects 281–2
 and information sharing 252, 257–63
 and origins of groups 269–70
 benefits of group augmentation 240(n22), 256–61, 271
 benefits through immediate self-interest 259, 260–1, 270, 272–3
 benefits through kin selection 240(n22), 249, 261, 262, 270, 272–3
 benefits through reciprocity 259–61, 272–3, 300–1(n68), 301(n69)
 co-evolution of sociality and brains during 337–8, 345–6
 through group selection, *see* group selection
 group organisation 247–9, 263; *see also* groups, co-operative activities in
 and age structure 261–2
 and division of labour 249, 272
 and emotional contagion 254–6, 257, 298–9(n16, n18, n20), 299(n27)
 and reproductive suppression 245, 256–7
 and reproductive synchrony 249, 256, 257
 and ritualised behaviour 250–1, 252, 253
 and self-categorisation 252–3, 257, 298(n18), 338
 and sex composition 262–3, 345–6

Cambridge University Press

0521662737 - Animal Traditions: Behavioural Inheritance in Evolution

Eytan Avital and Eva Jablonka

Index

[More information](#)

420 Index of subjects

- group organisation (*cont.*)
 and sharing of information in 247–8,
 257–63, 281–2, 297
 and social roles 262, 263
 and traditions 243, 277–89; *see also*
 animal traditions
 and tutoring of young 245–6, 249
 derived from family behaviours
 249–51, 257, 270, 299(n27)
 derived from individual behaviour
 252
 dissolution of 263–9, 297
 emergent 251–2
 stability of 268–9, 272, 277, 297
 group selection 170(n77), 241(n48),
 273–7, 288–9, 297, 301(n70, n72)
 and conformist social learning 277,
 297
 and group reproduction 241(n45),
 274–6, 301(n72), 302(n74)
 and kin groups 275
 and pair selection 164–5, 275
 and positive frequency-dependent
 selection 276–7
 evolutionary importance of 273–4,
 301(n70)
 relation to individual selection 274,
 302(n74)
 groups, co-operative activities in 247,
 281–2
 escape 244, 246, 247, 271
 group-fighting 244–5, 247, 252, 281
 hunting and foraging 245–6, 250, 2
 migration 256
 mobbing 246–7, 255–6, 271
 nursing 245, 249–50, 260, 299(n36)
 Guinness, F. E. 300(n41, 65)
 Gyger, M. 139(n40)
- habits 4–6, 9, 10, 12–15, 22, 23, 24, 30,
 35–6, 63, 95–99, 131, 134–5, 237,
 278–89, 305–6, 311, 346, 347(n2),
 353; *see also* animal traditions;
 cultural evolution
 and adaptive radiation in mammals
 341
 and convergent evolution 341
 effects on the evolution of sexual
 dimorphism 262–3, 342–6
 guiding selection for domestication
 341
 guiding the evolution of morphology
 and behaviour 311, 315–16, 333–5,
 338–41
 Haig, D. 188, 189, 205(n23, n24),
 350(n41)
 Halcomb, C. G. 102(n25)
 Haldane, J. B. S. 102(n30), 319, 320–1
 Ham, R. 103(n58)
 hamadryas baboon 227–8, 251, 256,
 262, 270, 272
 Hamilton, L. D. 206(n34)
 Hamilton, W. D. 7, 140(n52), 176, 177,
 204(n4), 239(n11), 300(n58),
 301(n73)
 handicap principle 125–6, 144,
 205(n10), 216–17
 and alloparenting 216–17
 and begging of offspring 179–80
 and mate choice 125–6, 144–5
 Hankins, W. G. 101(n12), 102(29)
 Hansen, T. F. 242(n62)
 Harcus, J. L. 170(n74)
 Hardy, A. 289, 303(n97), 311, 319, 341,
 348(n11), 348(n17), 349(n34), 350(n37)
 Harper, J. L. 348(n12)
 Harris, M. A. 140(n49)
 Harvey, A. W. 350(n35)
 Hasler, A. D. 102(n32)
 hatching asynchrony 191–3, 206(n28,
 n29)
 Hatfield, E. 298(n12)
 Hauser, M. D. 102(n38), 241(n37),
 302(n85)
 Haviland, M. B. 61(n4)
 Heike, D. 103(n50)
 Heil, P. 349(n32)
 Heinrich, B. 261, 299(n37)
 Heinsohn, R. G. 239(n11), 240(n17),
 241(n44, 48)
 helping 208, 209, 231–2, 238–9,
 242(n72)

- adaptive explanations of 212–25
 and coercion 219–20, 222–3, 224,
 240–1(n35)
 and costly signalling (self-advertising)
 216–18, 220
 and delayed dispersal 215
 and dispersal patterns 224–5, 226
 and kin selection 218–20, 225,
 240(n22)
 and mate preference 217, 230–1,
 240(n23)
 and mutualism 220, 223–4, 240(n22)
 and parenting style 214–15, 234–6
 and reciprocal altruism 220–2,
 224–5
 and reputation 224
 and skill acquisition 214–16, 225,
 232, 234, 309
 as extended parental care 215–16
 evolutionary origin of 216
 in Arabian babblers 216–17
 in European bee-eaters 210–11, 215,
 218
 in green woodhoopoes 221–2
 in jackals 220
 in vampire bats 220–1
 in voles 234–5
 in white-fronted bee-eaters 218–20,
 225
 in white-winged choughs 214–15,
 224, 226–7
 Hemmer, H. 300(n50)
 Hendrichs, H. 61(n9), 167(n16)
 Hepper, P. G. 138(n15)
 heredity, limited and unlimited 53,
 357
 heritability 42–3, 109
 Herrenstein, R. J. 101(n17)
 Herter, K. 75, 76, 101(n1), 102(n24)
 Heyes, C. M. 32(n14), 90, 94, 103(n56),
 n58, n63), 302(n84)
 Hill, D. A. 302(n78)
 Hill, G. E. 152, 168(n31, n34, n36)
 Hinde, R. A. 61(n1), 348(n5)
 Hiraiwa, M. 207(n55)
 Hoi, H. 240(n23)
 Hölldobler, B. 369(n15)
 Holliday, R. 62(n24)
 Hoogland, J. L. 299(n29), 300(n59)
 Hooker, B. I. 170(n74)
 Hooker, T. 170(n74)
 Horn, A. G. 206(n33)
 Huck, U. W. 138(n22)
 Huffman, M. A. 302(n94)
 Hughes, R. N. 138(n14)
 Hultsch, H. 103(n50)
 human culture, *see* cultural evolution,
 in humans
 human social evolution, *see* cultural
 evolution, in humans
 human sociobiology 8–9, 32(n7); *see*
 also evolutionary psychology
 Hume, R. 167(n21), 168(n28)
 Hunt, J. H. 369(n8, n9)
 Hurford, J. R. 369(n21)
 Hurst, L. D. 205(n24)
 Huxley, J. 349(n34)
 hybridisation 84, 295
 Hyman, S. E. 101(n10)
 imitation 91–5, 100, 103(n58, n61)
 and cumulative cultural evolution
 94–5
 compared with social influence 92–5
 motor 93
 vocal 6, 93; *see also* dialects
 Immelmann, K. 80, 102(n35), 289, 291,
 303(n97, n100, n106)
 imprinting, behavioural 78–81, 83–4,
 128–9, 131
 and mis-imprinting 295
 and sensitive period 78–9
 evolution of 128–9, 155, 316, 320–1
 evolutionary effects of 130, 132
 filial 78–9, 316
 in insects 354, 355, 356
 olfactory 79, 90
 on food 118
 on habitat 81, 294–5, 303(n105)
 on host 179, 140(n62), 296,
 303(n105)
 on song 80, 83, 153, 292–3

422 Index of subjects

- imprinting, behavioural (*cont.*)
 sexual 80, 127–30, 132, 152, 155–6,
 242(n56), 295–6
 social 127
 speciation through 130, 289, 291–6
 through alloparents 229–31
- imprinting, genomic, *see* genomic
 imprinting
- Ims, R. A. 299(n24)
- inbreeding 124, 128–9, 138(n5),
 139–40(n47), 155, 227, 228
- inclusive fitness, *see* fitness, inclusive
- individual learning, *see* asocial learning
- infanticide 194, 245, 257
- information 51–2
 Bateson's definition 53
 centres 259–60
 in information theory 52
 modular and non-modular 52, 53
 reification of 52
 semantic content 52–3
 socially transmitted by insects 354–7
 symbolically encoded 21–2, 26, 359
- information sharing
 with family and group members 247,
 248, 257–63, 297; *see also*
 alloparental care; group
 organisation
 with mates 147, 162–4
 with offspring 163, *see* maternal
 transmission; parental transmission
- inheritance
 definition of 54
 of acquired characters 19, 30
 of phenotypes 50
- inheritance systems 28, 59, 68, 353
 behavioural 27–8, 59, 60, 63, 68, 353,
 357–60
 epigenetic 59, 62(n24)
 genetic 37–51, 353, 357
 linguistic 364–66
- innate behaviours and preferences 8,
 10, 30, 81, 100, 117, 184, 305, 309
 evolution of 317–25, 346
 in birds' nest construction 305, 307,
 308, 309
 in birdsong 82, 84
 in orb-web construction 64–5, 67,
 81–2
- insects 151, 291, 320, 329, 353–7
 Insel, T. R. 207(n53), 242(n69)
- instinct, *see* innate behaviours and
 preferences
- instructive processes in evolution
 19–21, 25
- Itani, J. 302(n94)
- Jablonka, E. 32(n15, n16), 33(n22),
 62(n15, n24), 140(n65), 205(n22,
 n24), 241(n47, n53), 242(n61, n62,
 n64), 299(n30), 301(n70), 349(n28),
 369(n19, n23)
- Jackson, R. R. 101(n2)
- Jaisson, P. 369(n13)
- Jamieson, I. G. 239(n10)
- Janetos, A. C. 168(n42)
- Janeway, C. A. 62(n22), 138(n20, n21)
- Japanese macaques 10, 97–9, 280,
 285–6, 287, 302(n78), 366
- Jarman, P. J. 300(62)
- Jarvis, J. U. M. 302(n75)
- Jenkins, P. F. 303(n102)
- Johannsen, W. 43, 51, 61(n6, 13)
- Johns, T. 139(n35)
- Johnsgard, P. A. 101(n19)
- Johnson, R. B. 303(n102)
- Johnston, T. D. 240(n15)
- Johnstone, R. A. 205(n9)
- Jolly, A. 299(n23)
- Jones, W. T. 139(n45)
- Källander, H. 103(n52)
- Kamin, L. J. 32(n4)
- Karpiuk, P. 140(n22), 207(n50)
- Kavaliars, M. 299(n36)
- Kavanau, J. L. 101(n11), 169(n64)
- Kawai, M. 32(n10), 103(n67), 302(n94)
- Kawamura, S. 32(n10), 103(n67)
- Kehoe, F. P. 241(n49, 52), 242(n55)
- Keller, L. 369(n12)
- Kendrick, K. M. 140(n58)
- Kenward, R. E. 300(n58)

- Keverne, E. B. 350(n40), 351(n42)
 Kilner, R. 205(n9)
 kin selection 176–7, 204(n4); *see also*
 fitness, inclusive
 Kinsley, C. H. 207(n51)
 Kirkpatrick, M. 137(n3)
 Kitchener, A. 139(n30)
 Kleiman, D. G. 300(n55)
 Kleindorfer, S. 240(n23)
 Klint, T. 242(n58)
 Klopfer, M. 207(n39), 348(n20)
 Klopfer, P. 102(n33), 207(n39), 348(n20)
 Knight, C. 369(n21)
 Knobil, E. 299(n25)
 Koenig, W. D. 239(n2, n8)
 Köhler, W. 102(n22), 167(n16)
 Kokko, H. 169(n51)
 Komdeur, J. 240(n16)
 König, B. 137(n2)
 Koppel, M. 62(n16)
 Krebs, C. J. 300(n45, n46)
 Krebs, E. A. 167(n19)
 Krebs, J. R. 103(n53), 239(n5), 240(n25)
 Kreulen, D. A. 139(n35)
 Kruger, A. C. 32(n18), 103(n64)
 Kruijt, J. P. 102(n34), 242(n58, n59)
 Kruska, D. 300(n49)
 Kruuk, H. 300(n59), 348(n21)
 Kummer, H. 32(n10), 227, 298(n6),
 299(n23), 299(n39)
 Kunkel, J. G. 303(n97)
 Kunkel, P. 170(n75)
 Kunz, T. H. 240(n33)
- Labov, J. B. 138(n22)
 Lacey, E. P. 138(n6)
 Lachmann, M. 205, (n10), 241(n45, n47,
 n53), 242(n61, n62, n64), 299(n30)
 Lack, D. 149, 167(n18), 192, 206(n29),
 214, 239(n12), 240(n15)
 Lack, M. 32(n21),
 lactase-I 13, 24, 188–90, 206(n25), 340
 lactose absorption 13–15, 28, 32(n12),
 350(n34)
 Laland, K. N. 33(n26), 139(n26), 116,
 140(n63), 303(n108), 349–50(n34)
- Lamarck, J. B. 304, 335
 Lamarckian evolution 19–20, 31, 304,
 314–15
 Lamarckism 19–21
 Lamb, M. J. 32(n15, n16), 33(n22),
 62(n24), 205(n22, n24), 350(n40)
 Lande, R. 137(n3)
 Langley, P. A. 369(n7)
 Langmore, N. E. 241(n38)
 language evolution 364–8, 369(n21),
 369–70(n24)
 Larsson, K. 140(n49)
 Le Bon, G. 298(n16, n18)
- learning
 adaptive importance of 70, 100,
 101(n14)
 and attention 72, 101(n13)
 and brain organisation 69, 84
 and categorisation 73–5, 77, 100, 257,
 336
 and emotions 71, 101(n10)
 and exploration 71, 326, 367
 and nerve cells 69, 84
 and selection of variations 20–1
 and stress 70–1, 101(n9); *see also*
 social death
 biased 77–8, 82
 definition of 69
 early 80, 99, 286; *see also* imprinting,
 behavioural
 ecological correlates of 310–13,
 348(n12)
 effects on evolution of morphology
 and behaviour 305–6, 334–6,
 338–46; *see also* habits
 evolution of, *see* learning-evolution
 from mates, *see* male–female
 co-operation; mate choice
 individual, *see* asocial learning
 in insects 354–7
 in natural conditions 76–7, 240(n33)
 socially mediated, *see* social
 learning
 through conditioning 73, 221
 through insight 75, 103(n61)
 trial-and-error, *see* asocial learning

424 Index of subjects

- learning-evolution 101(n14), 304, 310, 312, 346–7
 and co-evolution of sociality and brain 337–8
 and environmental stability 310–11, 312–13, 316, 325, 348(n12)
 and exclusive maternal transmission 344–5
 and maternal effects 329, 342–6
 and modality-switching 333–5
 and nest building 305–9, 330–3
 and niche construction 311, 312, 313
 in a constant environment 312–13, 316, 346–7
 in an ILC environment 328–9, 337, 349(n28)
 in rapidly varying or stable but complex environments 313, 325–8, 349(n23, n27)
 in terrestrial insects 354
 involving the assimilate–stretch principle 331, 332, 333, 335–6
 of learning rules 335–8
 that lengthens the behavioural sequence 330–3
 through genetic assimilation 317–25, 330–47
 through use and disuse 304, 314–15, 333–5
- Leger, D. W. 139(n38)
 Legge, S. 241(n44)
 Lemon, R. E. 103(n51)
 Leonard, M. L. 206(n33)
 Lessells, C. M. 239(n5, n7), 240(n25)
 Lévy, F. 207(n53)
 Lewis, A. C. 369(n5)
 Lewis, S. 239(n3), 299(n35)
 Lewontin, R. C. 28, 30(n4), 33(n24), 61(n6), 311, 348(n11)
 Leyhausen, P. 139(n30)
 Liber, H. 168(n47)
 Lieberman, A. F. 205(n21)
 life styles in animal societies 22–3, 24, 98–9, 124, 198, 200, 236, 268, 278–9, 280, 284, 285, 302(n78), 342–3, 353
- Liffield, J. T. 168(n35, n36)
 Ligon, J. D. 222, 239(n11), 240(n34)
 Ligon, S. H. 222, 239(n11), 240(n34)
 Lindström, J. 169(n51)
 Lisk, R. D. 138(n22)
 Löhr, H. 139(n44)
 Lorenz, K. 79, 102(n31), 117, 139(n27), 148
 Lott, D. F. 32(n9), 302(n78)
 Lozano, G. A. 139(n34)
 Lung, N. P. 138(n19)
 Lyon, B. E. 206(n34)
- Ma, W. C. 369(n7)
 MacArthur, R. H. 348(n12)
 Macdonald, D. W. 139(n32), 240(n15), 298(n1), 299(n23), 302(n79)
 MacNair, M. R. 204(n7)
 Maestriperieri, D. 207(n53), 242(n67), 350(n39)
 Magrath, R. D. 206(n29)
 Malacarne, G. 169(n57)
 male–female conflict 141–7, 156, 162, 165, 166(n3), 166–7(n5), 167(n15), 167–8(n24), 205(n24)
 male–female pair co-operation 141, 145, 147, 156–7, 161, 172–3, 210–11
 and ‘commitment effect’ 167–8(n24)
 and duetting 159–60, 163–4, 169(n57, n61)
 and familiarity 154–6, 158, 168(n47), 228
 and learning 147, 158–60, 162–4, 182
 and mate choice 127–8, 147–57, 170(n76)
 and pair selection 164–6, 275
 evolution of 163–5
 involving pair-specific habits and preferences 147, 158, 160, 163–6
 that consolidates the pair bond 157–8, 161–2, 165, 169(n67)
 Marinier, S. L. 115, 139(n24)
 Marler, P. 102(n39), 139(n38, n40), 241(n37)
 Marquiss, M. 139(n45)
 Martel, F. L. 351(n42)

- Martin, K. 169(n53)
 Martin, T. E. 347(n3)
 Marx, K. 206(n26)
 Marzluff, C. S. 299(n37)
 Marzluff, J. M. 170(n76), 206(n35), 216,
 223, 240(n18), 241(n40), 242(n70),
 299(n37)
 Mason, J. R. 139(n36)
 mate choice 127–8, 143–4, 147–57,
 170(n76); *see also* female choice;
 imprinting, behavioural
 and coloration 151–3
 and courtship feeding 148–51, 163
 and learning 147–56, 158–9
 and match-making 228–9
 and phenotypic compatibility 155,
 156, 170(n76)
 and song-type 153–4
 familiarity as the basis for 154–6,
 158, 168(n42, n47)
 role of individuality in 148, 156–7,
 165–6
 maternal care 91, 107, 141, 245; *see*
also parental care
 effects on sex ratio and gender
 198–201, 207(n48, n51)
 in chukar partridge 66–7
 in the domestic mouse 105–7, 141
 investment in 166–7(n5)
 maternal effects (non-genetic) 108–9,
 112–16, 300(n47)
 maternal transmission; *see also*
 parental effects; parental
 transmission
 and the uterine environment 114,
 199–200
 and cognitive compatibility with off-
 spring 344–5, 350(n40)
 effects on the evolution of sexual
 dimorphism 342–6
 in insects 354–5
 of antibodies 113–14, 175, 260
 of gender-specific behaviour 114,
 138(n22), 198–201
 of parenting styles 130–2, 140(n58),
 233–4
 of skills and preferences 81, 106–7,
 112–13, 114, 115–16, 118–19, 127,
 130–2, 133–4, 138(n22), 140(n58),
 188, 197–8, 199–200
 through faeces 114–16, 354
 through genomic imprinting 345
 through milk 112–13, 116
 through saliva 113
 through the placenta 113
 mating systems 145–6
 long-term monogamy 128, 145, 147,
 155, 159, 167–8(n24), 177, 190,
 228–9
 polyandry 146
 polygyny 143, 146
 serial monogamy 158–9
 Matter, W. W. 102(n25)
 Matthews, R. W. 369(n8)
 Maynard Smith, J. 44, 61(n7), 62(n17),
 103(n48), 301(n70)
 Mayr, E. 289, 293, 303(n97, 98, 103)
 McCarty, J. P. 205(n10)
 McCleery, R. H. 169(n55), 170(n69)
 McDougall, W. 298(n18)
 McFarland, D. 140(n57), 298(n5)
 McGregor, P. K. 239(n5)
 McGrew, W. C. 302(n80)
 McLeskey, J. 102(n21)
 Mech, L. D. 250, 298(n3)
 Medina, R. 207(n42, 45)
 Meehan, A. P. 137(n1)
 meerkats 214, 243–7, 249, 250, 255–6,
 257, 258, 298(n1)
 Meeuwissen, G. B. 102(n34), 242, (n58,
 59)
 memes 7, 24–8, 32(n21), 139(n43),
 357–9
 and cultural evolution in animals
 27–8, 359
 definition of 25
 problems in the use of the term 26–8
 memory
 and brain injuries 85–6
 and cognitive maps 86–7
 as reconstruction 90
 dependence on context 89–90

426 Index of subjects

- memory (*cont.*)
 evolution of 87, 89, 311
 in nightingale 88, 89
 in scatter hoarders 88–9
 types of 85–90, 101(n14), 102–3(n45)
- Mendelian genetics 39–42
- Mendelssohn, H. 300(n41)
- mice 114, 260; *see also* domestic mouse
- Michener, C. D. 369(n8)
- Milinski, M. 101(n9)
- milk 13, 14, 15, 36, 112–13, 175, 190, 260
- Miller, R. E. 298(n17)
- Milner, B. 102(n43)
- mimicry 91–5, 103(n61)
- Mirsky, I. A. 298(n17)
- Mirsky, P. J. 140(n59)
- Mock, D. W. 181, 204(n3), 205(n11, n12), 206(n27), 207(n38)
- module
 of information 52–3
 mental or neural 9–10, 32(n8), 58, 279, 288, 360–2, 363–4, 369(n18)
- Moehlman, P. D. 240(n29)
- Møller, A. P. 101(n9), 167(n10)
- Molnar, P. 32(n20)
- monkeys 91, 92, 184–5, 196, 251, 255;
see also baboons; chimpanzees;
 Hamadryas baboons; Japanese
 macaques
- Moore, B. R. 103(n58, n60)
- Moore, C. L. 201, 207(n48, n49)
- Moran, G. 298(n1)
- Morgan, C. L. 317
- Morgan, H. D. 207(n53)
- Morris, D. 55, 56, 62(n19)
- Morris, J. S. 101(n10)
- Morton, E. S. 168(n37)
- Mosley, J. C. 300(n57)
- Moss, C. J. 103(n49)
- Mountjoy, D. J. 103(n51)
- Mousseau, T. A. 138(n8), 349(n29)
- Mulder, R. A. 240(n30), 241(n36, 38)
- Muller, R. E. 205(n19)
- Münchhausen 368, 370(n25)
- Mundinger, P. C. 18, 32(n14), 302(n86)
- Murie, J. O. 140(n49)
- Murphy, J. V. 298(n17)
- Myers, J. H. 300(n45)
- Nadel, L. 103(n46).
- Nager, R. G. 169(n55)
- Nakagawa, N. 302(n78)
- Nalepa, C. A. 369(n6, n7, n8, n9, n16)
- natural selection, theory of 2, 3, 19, 20, 30–1, 51, 136, 315
- Neill, J. D. 299(n25)
- Nelson, J. B. 161, 168(n42), 169(n65)
- nest building 119, 136, 304–10
 and female coloration 306, 339, 347(n3)
 and social learning 307–9
 evolving through the
 assimilate–stretch principle 330–3
 functions of 309
 in lovebird hybrids 308
 in swallows 331–3
 in weaver-birds 307–8, 309
 innate components of 304, 307–8, 309
 Wallace’s explanation of 305–7, 339, 347(n3), 360
- Neville, H. J. 101(n6)
- Nevison, C. M. 351(n42)
- Newton, I. 139(n45), 169(n52)
- niche construction 28, 286–7, 311, 312, 313, 335–6, 343, 349–50(n34), 355, 356
- Nicolai, J. 140(n62), 296, 303(n110)
- Niewiarowski, P. 138(n7)
- Nisbett, I. C. T. 167(n21), 168(n25, n28)
- Normile, D. 32(n9), 302(n78)
- Norton-Griffiths, M. 239(n14), 349(n25)
- Nottebohm, F. 168(n38)
- Nowak, M. A. 241(n43)
- Nudds, T. D. 241(n49, n52), 242(n55)
- O’Connor, R. J. 139(n33), 300(n60), 349(n24)
- Odling-Smee, F. J. 28, 33(n25, n26), 349–50(n34)
- Oftedal, O. T. 349(n26)

- Öhman, A. 101(n10)
 orb-web spiders 63–5, 67, 70, 100(n1),
 110
 Osborne, F. 317
 Owen, M. 168(n40, n47), 242(n54)
 Owings, D. H. 139(n38)
 Oyama, S. 28, 33(n23), 52, 61(n14)
- Packer, C. 139(n45), 239(n3), 240(n30),
 299(n35, n38)
 Pagel, M. 206(n34)
 Pál, C. 348–9(n22)
 Palacios, A. G. 168(n33)
 Palmer, A. R. 350(n35)
 Papaj, D. R. 369(n5)
- parent-offspring conflict 117–18, 171,
 174, 177–8, 180, 181, 182, 185, 187,
 191, 202, 203–4, 207(n52), 226
 and adoption 226
 and begging 172–4, 178, 179–80,
 182–4, 185–7, 205(n19), 211
 and costly signals 179–80, 187, 204,
 205(n9)
 and genomic imprinting 188–90
 and hatching asynchrony 191–3
 and learning 171, 174, 182–5, 186,
 204
 and nagging for information 186–7
 and nest sanitation 172, 193–4
 and sex-ratio manipulation 206(n27)
 and temper tantrums 178, 186
 and the asymmetry of the
 relationship 179, 205(n8)
 and the weaning process 182–7,
 189–90, 362
 terminology 181–2
- parental care 105, 107, 110, 117, 141,
 157–62, 207(n53), 312, 327–8; *see*
also maternal care
 and caring skills 203
 definition of 109–10
 evolution of 111, 166–7(n5)
 extended 119, 160, 215–6
 in European bee-eaters 211
 in great tits 171–3
 in voles 234–5, 236–7
 investment in 166–7(n5), 175, 207(52)
 involving differential treatment of
 offspring 173, 193, 194–7, 198–9,
 201, 207(n41, n52)
 measures of 110, 11–12
 parental control 192–202
 and coercion 219–20, 240–1(n35)
 and hatching asynchrony 191–2
 and litter size 194
 and offspring frailty 276–7
 and offspring sex 194–7, 207(n41)
 and social rank 196–8
 related to dispersing sex 198–9,
 207(n52)
- parental effects 107–9, 137, 138(n4); *see*
also maternal effects
 environmentally induced 108–9,
 138(n6), 300(n47)
 evolution of 109, 329
 genetic 108
- parental transmission 105, 111, 117,
 130, 136, 201, 267–8, 327, 354; *see*
also maternal transmission
 and cross-fostering experiments 112,
 119, 123, 127, 133, 152, 234, 235,
 267
 channels of 105, 112–16, 124, 137, 354
 evolution of 130–2
 of alarm calls 120, 121, 139(n38, n40)
 of anti-predator behaviour 119–22,
 139(n40)
 of food preferences 106–7, 112–13,
 115–16, 118
 of foraging and hunting skills 81,
 118–19, 133–4, 139(n37), 151, 326–7
 of habitat preference 122–5; *see also*
 ecological legacies, philopatry
 of mate preference 125–30
 of sex-ratio and gender-specific
 behaviour 114, 138(n22), 199–200
 of social rank 197–8
 of style of parental care 130–2,
 140(n58), 164–5, 198, 233–6
- Parker, G. A. 181, 204(n7), 205(n12),
 206(n27), 240(n35), 241(n38),
 299(n31)

428 Index of subjects

- Pärt, T. 123, 139(n45, n46), 169(n52)
 Pascal, B. 346
 Pavlov, I. 73
 Payne, J. H. 139(n43)
 Peakall, D. B. 100(n1)
 Pellmyr, O. 369(n10, n11)
 Pennisi, E. 206(n25)
 Perrins, C. M. 61(n1), 169(n55), 170(n69),
 204(n1)
 Peterson, D. 32(n14)
 Petrie, M. 300(n67)
 phenotype, *see* genotype and pheno-
 type; plasticity
 phenotypic cloning 131, 231, 238, 342,
 344
 by mother 131, 342
 through alloparenting 231–2
 philopatry 122–5, 195
 Piaget, J. 349(n34)
 Pianka, E. R. 138(n11), 348(n12)
 Pickering, S. P. C. 161, 169(n65)
 Pickert, R. 139(n40)
 Pierotti, R. 239(n9)
 plasticity 11, 12, 44, 46–51, 60, 85,
 278–9, 316, 322–3, 349(n23), 367
 and genetic assimilation 317, 322–3,
 330, 335–6
 and individual personality 61(n9)
 behavioural 11, 76, 83, 85, 367
 Plato 45
 Plotkin, H. C. 116, 139(n26)
 Polsgrove, L. 102(n21)
 Poole, J. H. 103(n49), 300(n42)
 Posner, M. I. 101(n13)
 Power, D. M. 168(n31, 36)
 Pravosudov, V. V. 103(n54)
 preferences 76, 112, 131, 133–5, 354,
 355, 356
 musical, in rats 76
 for food types 66, 106–7, 112–13,
 115–16, 118
 of food type and host in insects
 354–6
 sexual 125–30; *see also* imprinting,
 sexual
 Price, J. J. 302(n88)
 Price, K. 140(n49)
 primates, 124, 185, 196, 207(n53), 251,
 302(n78), 345–6; *see also* monkeys
 Prop, J. 168(n42)
 Proust, M. 85
 Provenza, F. D. 138(n15, n16)
 Provine, R. R. 298(n15)
 Pruett-Jones, M. A. 302(n91)
 Pruett-Jones, S. G. 302(n91)
 Pryce, C. R. 207(n53)
 punishment 222–3, 259
 Pusey, A. E. 139(n45), 239(n3), 240(n30),
 299(n35)
 Racey, P. A. 240(n33)
 Raichle, M. E. 101(n13)
 Rapson, R. L. 298(n12)
 Rasa, A. 298(n8)
 Raspe, R. E. 370(n25)
 Ratner, H. H. 32(n18), 103(n64)
 rats 91, 93, 114, 207(n53), 260; *see also*
 black rat, brown rat
 ravens 88, 102(n42)
 Rechav, G. 369(n19, n23)
 reciprocity 220–5, 272–3, 300–1(n68),
 301(n69)
 Redondo, T. 207(n42, 45)
 Reed, C. F. 100(n1)
 Reeve, N. 101(n1)
 rhesus monkeys 196–8, 203, 223, 233
 Reichman, O. J. 103(n52)
 Reilly, S. L. 61(n4)
 replicators and vehicles, distinction
 between 358–60
 reproducer concept 24, 28
 reproductive suppression 240–1(n35),
 245, 256–7, 275–6
 reproductive synchrony 249, 256
 Reyer, H.-U. 240(n23), 242(n57)
 Richerson, P. J. 15, 32(n13), 242(n63),
 276, 277, 302(n76, n77), 349(n23,
 n27)
 Ricklefs, R. E. 206(n28)
 Riedman, M. L. 239(n3), 240(n30),
 241(n52)
 Rieth, H. J. 102(n21)

- Robertson, F. W. 62(n23)
- Robinson Crusoe 321
- rodents 194, 198–201, *see also* domestic mouse, mice, rats, voles
- Rohwer, S. 242(n71)
- Röndigs, M. 242(n71)
- Roosenburg, W. M. 138(n7)
- Rose, S. 32(n4), 101(n7)
- Rosenblatt, J. S. 138(n9), 207(n53)
- Rosenfield, I. 102(n44)
- Ross, K. G. 369(n8, 12)
- Rowe, C. L. 239(n5)
- Rowe, F. P. 137(n1)
- Rowell, T. E. 207(n44)
- Rowley, I. 168(n41, n44), 169(n55)
- Royama, T. 170(n68), 204(n1)
- Rusiniak, K. W. 101(n12), 102(n29)
- Rydén, O. 204(n1)
- Sanwald, R. 369(n14)
- Sapolsky, R. M. 101(n9)
- Sarrazin, F. 300(n56)
- Savard, J.-P. L. 241(n50)
- Schacter, D. L. 102(n45), 103(n47)
- Schaller, G. B. 139(n31)
- Scharloo, W. 348(n15)
- Schenkel, R. 298(n4)
- Schlicht, E. 73, 74, 101(n16), 299(n28)
- Scholz, A. T. 102(n32)
- Schwabl, H. 206(n31)
- Scott, J. P. 242(n71)
- Scott, W. E. D. 348(n7)
- Sealy, S. G. 206(n32)
- Searcy, W. A. 168(n38)
- Seibt, U. 170(n74)
- Seiger, M. B. 140(n59)
- selection, *K* and *r* 348(n12)
- selection, levels of 301(n70)
- gene 176–7
- group 170(n77), 241(n148), 273–7
- individual 176–7, 274
- kin 176–7, 213
- pair 164–5, 275
- selective processes in evolution 19–21, 24
- selfish genes 7, 181–2
- self-medication 119, 139(n37)
- Sella, G. 241(n45), 299(n30)
- Serpell, J. 300(n51)
- Seyfarth, R. M. 121, 139(n39), 299(n21)
- Sheard, N. M. 207(n39)
- Sheldon, F. H. 349(n31)
- Sherley, G. H. 240(n24), 242(n60)
- Sherman, P. W. 300(n59), 302(n75)
- Sherry, D. F. 103(n47), 103(n52, 53, 59), 138(n15)
- Shettleworth, S. J. 101(n3, 14), 103(n52)
- sibling rivalry 171, 173, 174–5, 178, 191–2, 202–3, 211
- and birth order 203
- and hatching asynchrony 191–3
- and siblicide 175
- Sidharta, M. 298(n14)
- Sigmund, K. 241(n43)
- Sing, C. F. 61(n4)
- Skinner, B. F. 75
- Skira, I. J. 169(n55)
- Skolnick, N. J. 138(n22), 242(n68)
- Skutch, A. F. 168(n29), 169(n50), 206(n37), 239(n2, n4, n14), 241(n39, n41)
- Slagsvold, T. 168(n35, n36), 206(n32)
- Slater, P. J. B. 101(n9), 102(n39, n41), 103(n51), 140(n53, n56), 168(n39), 302(n87)
- Slobodchikoff, C. N. 139(n38)
- Smith, A. 103(n48)
- Smith, C. C. 103(n52)
- Smith, D. G. 205(n19)
- Smith, H. G. 103(n52)
- Smith, N. C. 138(n19)
- Smith, R. J. F. 298(n19)
- Smith, S. M. 167(n23)
- Smith, W. J. 169(n56, n57), 170(n74)
- Smokler, R. 103(n65)
- Smotheran, W. P. 138(n17)
- Snowdon, C. T. 207(n53)
- Sober, E. 301(n70, n71), 302(n74)
- social death 263–9, 297
- social learning 2–4, 17–18, 21, 29, 58–60, 68, 90–5, 100, 134, 138(n13), 277; *see also* imprinting

430 Index of subjects

- social learning (*cont.*)
 and parent-offspring conflict 171,
 174, 182–5, 186, 204
 and social organisation 91
 and stress 264–6
 as part of development 25, 27–8, 29,
 58–9, 237–8
 by tarbutniks 3–5
 compared with asocial learning 90,
 94–5
 evolution of 111, 325–8, 338,
 349(n23, n27); *see also*
 learning-evolution
 from mates 147, 158–60, 162, 182
 in black rats 133–5
 in chukar partridges 66–8, 82
 in humans 356–7, 364, 365–7
 in Japanese macaques 10, 97–9,
 103–4(n67)
 in terrestrial insects 353–7
 of song in songbirds 82–5, 281–2
 prevalence of 91
 socially influenced 91–3, 94–5,
 103(n58)
 through alloparents 229–31, 232,
 233–9; *see also* adoption;
 alloparenting; helping
 through emulation 93, 103(n61)
 through imitation 91–5, 100,
 103(n58, n61)
 through mother, *see* maternal
 transmission, of skills and
 preferences
 transgenerational transmission
 through 15–16, 29, 90, 99, 100,
 119, 134–5, 138(n13); *see also*
 animal traditions, cultural
 evolution
 types of 91–5, 103(n57, n58)
 social organisation 17, 90–1, 196; *see*
also group organisation
 social traditions, *see* animal traditions
 sociobiology theory 6–7, 82, 353
 applied to humans 9, 32(n7)
 Soewondo, S. 298(n14)
 Soukhanov, A. H. 32(n17)
 Southwick, C. H. 242(n71)
 Spalding, D. 79, 316, 321
 speciation 31–2(n3), 129–30, 140(n62),
 289–96; *see also* cultural speciation
 species 31–2(n3), 303(n98)
 Spurway, H. 300(n48), 341, 350(n38)
 Squire, L. R. 102(n45)
 Stacey, P. B. 239(n2, n8)
 Stamps, J. 168(n26), 205(n18), 206(n32)
 Stander, P. E. 300(n66)
 Stanley Price, M. R. 300(n57)
 Stark, O. 300(n40)
 Starr, E. 102(n20, n21)
 Stenning, M. J. 206(n28)
 Stevens, L. 301(n70)
 Stevens, T. A. 103(n53)
 stimulus enhancement 74–5
 Stinson, C. H. 204(n3)
 Stoleson, S. H. 206(n28)
 stress 70–1, 101(n9), 194, 263–5, 267–8
 Strindberg, A. 141
 Studdert-Kennedy, M. 369(n21)
 Suboski, M. D. 298(n20)
 Sulloway, F. J. 202, 203, 207(n54)
 Svare, B. B. 207(n51)
 swallows 306, 322, 331–3, 362
 Swift, S. M. 240(n33)
 symbolic representation and symbolic
 systems 21, 22, 26, 359, 365, 366,
 367–8
 Szathmáry, E. 62(n15, n17), 103(n48),
 301(n70), 302(n74), 369(n23)
 Tabashnik, B. E. 369(n11)
 Taber, R. D. 300(n64)
 Taborsky, B. 303(n105)
 Taborsky, M. 303(n105)
 Tajfel, H. 298(n11)
 Tamarin, R. H. 300(n45, n46)
 Tanaka, I. 302(n94, n95)
 tarbutniks 3–5, 12–13, 28, 31(n2), 50,
 138(n5), 279, 287, 309
 Tatar, M. 299(n38)
 Tauber, C. A. 303(n99)
 Tauber, M. J. 303(n99)
 Tavory, I. 350(n40)

- Tchernov, E. 303(n107)
 te Velde, J. H. 348(n15)
 Tear, T. H. 300(n57)
 technological evolution 21, 25
 Tempelton, A. R. 303(n98)
 ten Cate, C. 102(n34), 140(n57), 230,
 242(n58, 59), 303(n108)
 Teoh, J.-I. 298(n14)
 Terkel, J. 133, 134, 140(n66), 350(n36)
 Teuber, H.-L. 102(n43)
 Teuschl, Y. 303(n105)
 Thompson, J. N. 369(n10, n11)
 Thorpe, W. H. 159, 169(n57), 170(n73)
 Tinbergen, N. 101(n18)
 tits 34–6, 61(n1), 88, 89, 171–3; *see also*
 great tits
 Todt, D. 193(n50), 170(n74)
 Tolstoy, L. 202, 203
 Tomasello, M. 32(n18), 103(n62),
 103(n64)
 Topoff, H. 369(n14)
 Tovar, S. H. 239(n14)
 Townsend, C. R. 348(n12)
 Trabant, J. 369(n21)
 traditions, *see* animals traditions;
 cultural evolution
 Tranel, D. 101(n10)
 Travers, P. 62(n22), 138(n20, n21)
 Trivers, R. L. 166(n1), 177, 178, 182, 183,
 204(n5), 205(n15), 206(n27), 220,
 239(n11), 240(n31)
 Tulving, E. 102(n45)
 Turner, D. C. 240(n33)
 Turner, J. C. 298(n11), 301(n69)

 units of evolution 24–9, 31
 urbanisation 10, 23, 24, 294–5

 Van Rhijn, J. 169(n51)
 Varela, F. J. 168(n33)
 Vehrencamp, S. L. 167(n6)
 Vieth, W. 299(n21)
 Vincent, A. 240(n30)
 voles 207(n53), 234–5, 236
 Von Frisch, K. V. 298(n19)
 Von Holst, D. 101(n9), 298(n9), 300(n46)

 Vos, D. R. 102(n34), 140(n57)

 Waddington, C. H. 28, 33(n24), 61(n10),
 311, 317, 318, 319, 348(n11, n15),
 349(n34)
 Wade, M. J. 301(n70)
 Wallace, A. R. 305, 306, 307, 315, 338,
 339, 347(n2, n3), 360
 Wallen, K. 242(n67)
 Walsh, C. 207(n53)
 Wang, Z. 203(n53), 242(n69)
 Ward, P. 259, 299(n32)
 Wasserman, E. A. 102(n23, n28)
 Watanabe, K. 32(n10), 103(n67),
 302(n94)
 Watson, J. B. 47, 48
 Weller, M. W. 168(n41)
 Welty, J. C. 139(n44)
 whales 6, 282
 Whitehead, H. 282, 302(n90)
 Whiten, A. 103(n58), 103(n66),
 302(n93)
 whydahs 129, 296
 Wickler, W. 160, 169(n59, n60),
 170(n74)
 Wiesner, B. P. 207(n39)
 Wigmore, S. W. 299(n33)
 Wilcox, R. S. 101(n2)
 Wiley, R. H. 168(n37)
 Wilkinson, G. S. 240(n32), 299(n33),
 301(n69)
 Williams, G. C. 7, 301(n70)
 Wilson, A. C. 289, 303(n97)
 Wilson, D. S. 301(n70, n71), 302(n74)
 Wilson, E. O. 6, 348(n12), 369(n4,
 n15)
 Winkler, D. W. 349(n31)
 Witt, P. N. 100(n1)
 wolf 250, 251, 253, 254, 256, 266–7,
 272, 300(n53), 337
 Wolf, J. B. 33(n26)
 Wolf, U. 61(n5)
 Wolfe, N. D. 139(n34)
 Wollberg, Z. 349(n32)
 Woodroffe, R. 240(n30)
 Wooller, R. D. 169(n55)

432 Index of subjects

- Woolfenden, G. E. 140(n49)
Wrangham, R. W. 32(n14), 302(n93)
Wrege, P. H. 240(n27, n28, n35)
Wright, J. 170(n71), 240(n22)
Wright, R. 9, 32(n6)
Wunderle, J. M., Jr. 169(n53, n54),
239(n13)
Wyles, J. S. 303(n97)
- Yamagiwa, J. 302(n78)
Yasukawa, K. 168(n38)
- Yom-Tov, Y. 303(n107)
Young, J. Z. 61(n2)
- Zahavi, A. 125, 140(n51), 144, 167(n8),
179, 180, 216, 217, 239(n11),
240(n20, n21, n22), 259, 299(n32)
Zahavi, Av. 140(n51), 167(n8), 239(n11),
240(n20)
Zentall, T. R. 32(n14)
Zuk, M. 140(n52), 167(n7), 168(n32)