

## INDEX

- abandonment  
 of dogs, 281
- aboriginal dogs, 16
- Aborigine, 18, 26, 303
- Abruzzo, 321, 345, 357
- affiliative behavior, 143, 250, 302
- African dog varieties, 17
- African wild dogs, 376
- aggression, 50, 73, 74, 78, 86, 121, 123,  
 161–76, 229, 231, 233, 283, 407  
 approaches to treatment, 235  
 as outcome of fear, 139  
 as welfare issue, 161  
 development of, 102–6  
 in social housing, 288  
 owner-directed, 103  
 pain-related, 166, 230  
 predatory behaviour and, 163  
 stranger-directed, 74
- akita, 122
- Alaskan Gold Rush, 46
- Alaskan malamute, 122
- All-Alaska Sweepstakes race, 46
- alpha roll, 214, 219
- Altai Mountains, 9
- Americans with Disabilities Act, 253
- Anatolian shepherd, 44, 411
- Andaman Islands, 302
- androgens, 78, 95
- animal cruelty laws, 176
- animal hoarding, 283
- animal shelters, 281, 310, 379, 390  
 as rehoming centers, 398
- animal-assisted interventions, 258, 408  
 use of therapy dogs in, 259
- animosity  
 toward dogs, 305, 308
- anxiety, 73, 101, 108, 141, 211, 216, 218,  
 241, 406
- appeasement behavior, 134, 141, 142–3, 235
- Applied Animal Behavior, 228
- archaeology  
 of dog and wolf remains, 8–10
- archaeozoology, 8, 405
- arginine vasopressin, 96
- artificial selection, 26, 43, 70, 109, 110,  
 144, 164, 336  
 for accentuated anatomical features, 276
- assistance dogs. *See* service dogs
- associative learning, 95
- attachment, 109, 135, 251, 301, 304  
 dog–human, 280, 302  
 human–dog, 248, 249, 257, 408  
 in dogs, 109
- attention, 184
- attention deficit hyperactivity disorder  
 (ADHD), 78
- attitudes  
 to animals, 301  
 to dogs, 301–13, 378, 386, 409
- auditory acuity, 145, 292
- Australian shepherd dog, 51
- BaMbuti, 304
- Bar Harbor studies, 94, 100, 109
- barking, 45, 52, 108, 121, 146, 211, 222,  
 231, 233, 283, 410  
 as referential communication, 191
- basenji, 31, 74, 105, 107, 168
- basset hound, 55
- beagle, 105, 168, 171
- behavior modification, 237, 407
- behavior problems, 73, 86, 211, 217, 229  
 as cause of relinquishment, 283,  
 406, 409  
 development of, 102–10  
 dietary effects on, 240  
 homeopathic treatments for, 241  
 management of, 237
- behavioral assessment methods, 174, 235
- Belgian shepherd dog, 73
- Belgian tervueren, 189
- Belyaev, Dmitry, 11, 28, 56, 57
- Beng, 309
- Bering Straits, 15, 23, 32
- Best Linear Unbiased Prediction (BLUP), 72
- blue heeler, 51
- body size  
 effects on behavior, 165  
 genetic determinants of, 37
- Bonn-Oberkassel grave, 12
- border collie, 51, 52, 60, 72, 234, 336
- boxer, 122
- brachycephaly, 276
- breast feeding  
 of puppies, 307
- breed differences  
 in behavior, 43, 51, 59, 70, 73, 74, 80,  
 87, 98, 103, 104, 106, 109, 110,  
 119–26, 144, 161, 167, 175, 202,  
 230, 233, 262, 336, 405, 407, 408  
 in development, 56, 406  
 in morphology, 56, 144, 336  
 in social development, 100  
 in visual field, 140
- breed identification, 168
- breeding values, 72
- breed-specific legislation, 86, 169, 175,  
 311, 407
- Buddhism, 305
- bull terrier, 233
- bulldog, 122, 276
- burial  
 of favorite dogs, 303
- Bushmen, 17
- candidate gene association studies, 77–9
- Canidae, 23
- Canine Behavioral Assessment and  
 Research Questionnaire  
 (C-BARQ), 119, 165, 169
- Canine genome, 30, 31
- Canis adustus*, 17
- Canis aureus*, 14
- Canis latrans*. *See* coyote
- Canis lupus*. *See* wolf
- Canis lupus arabs*, 14
- Canis lupus chanco*, 15
- Canis lupus pallipes*, 18
- Canis mesomelas*, 17
- Canis simensis*, 371, 376
- capture–neuter–release programs, 379
- carbon isotope ratios, 13
- Catahoula leopard cow hog dog, 47, 51
- Centers for Disease Control, 169, 311
- Chauvet Cave, 9
- chihuahua, 169, 233, 256, 275
- chow chow, 122
- chromosomes, 35
- clicker-training. *See* training methods
- clomipramine, 241
- cocker spaniel, 74, 105, 107, 168  
 English, 109
- cognition. *See* social cognition

- cognitive bias, 274, 280, 409  
 collie, 122  
 communication, 139–52, 407  
   definition of, 139  
   interspecific visual, 145  
   intraspecific visual, 140  
   of aggression, 171  
   ostensive, 189  
   referential, 191  
   via tail position, 141  
   vocal, 145–8  
 community dogs, 387  
 companionship  
   dogs as sources of, 249, 309, 402  
 compulsive behavior, 73, 233  
 cortisol, 96, 166, 222, 275  
 cosmetic surgery, 284  
 counterconditioning, 220, 238  
 coyote, 9, 336  
 critical periods. *See* sensitive periods  
 crossbreeding, 72  
 cross-fostering experiments, 98
- dachshund, 46, 55, 79, 169, 233  
 Dalmatian, 276  
 dangerous dogs, 86, 173  
   characteristics of owners of, 173  
 Dangerous Dogs Act 1991, 175, 311  
 Darwin, Charles, 26, 43, 55, 63, 228, 250  
 Darwin's finches, 411  
 debarking, 284  
 defense mechanisms, 304, 312  
 desensitization, 238  
 destructiveness, 108, 121, 231  
 detour task, 186  
 development  
   behavioral, 60–2, 94–111, 406  
   cognitive, 99, 183, 408  
   of brain, 94, 97  
 dingo, 17–18, 26, 30, 31, 345  
   persecution of, 18  
   social organization, 135  
   used for hunting, 303  
 displacement behavior, 52, 141, 217  
 distemper, 376, 410  
 distress vocalizations, 97, 100, 110  
 DNA  
   microsatellite, 33  
   mitochondrial, 9, 18, 23, 30  
   sequence analysis, 30  
 do-as-I-do paradigm, 189  
 Doberman pinscher, 47, 70, 74, 233, 234  
 dog attacks, 161, 310, 311  
 dog bites, 161, 164, 389, 406, 407  
   on children, 172  
   risk factors for, 164–74  
 dog breeding, 32, 56, 85, 167, 277, 409  
 dog eating, 16, 46, 305, 306  
   opposition to, 305  
 dog fighting, 74, 161, 167  
 dog mentality assessment test (DMA), 73  
 dog population management, 364, 378, 386–402, 409, 410  
   comprehensive approaches to, 390  
   through legislation, 395  
   through public education, 395  
 dog symbolism, 307, 312, 409  
 dog walking  
   benefits of, 264  
 dog–human relationships, 135, 185, 213, 248–65, 278, 402, 410  
   cardiovascular benefits of, 263  
   effects on general health, 264, 408  
   psychological benefits of, 256, 262  
   social benefits of, 256, 260  
 Dogo Argentino, 311  
 domestication, 9, 25–6, 57–9, 70, 81, 162, 278, 320, 405  
   behavioral effects of, 99, 146  
   effects on social cognition, 183  
   morphological effects of, 11–12, 407  
   syndrome, 29, 57–9, 405  
 dominance, 70, 104, 105, 137, 184, 407, 408  
   development of, 103–6  
   in companion dogs, 137–8  
   in dog training, 213  
   in playful interactions, 152  
   theory, 213  
 Dorobo, 303
- early handling effects, 96  
*Echinococcus*, 371, 376, 410  
 ecology  
   of free-roaming dogs, 320–65, 379, 409  
 Ein Mallaha, 14  
 eliminative behavior, 97, 108, 121, 231, 237, 283  
 embryology, 56  
 emotional contagion. *See* empathy  
 emotional support animals, 248, 254, 408  
   laws and regulations pertaining to, 254  
 empathy, 197  
 endophenotypes, 82  
 English springer spaniel, 170  
 epidemiology  
   of dog bites, 168  
 epigenetics, 83, 94, 96, 406  
 Epipaleolithic, 13  
 epistasis, 84  
 Eskimo dog, 16  
 estrous, 33  
 euthanasia, 284, 310, 379, 389, 391, 399, 406  
   for behavior problems, 73, 161, 279
- evolution, 406, 410  
   of social cognition, 139, 202  
   of working dogs, 43–63  
 evolutionary genetics, 30  
 eye, 52, 60  
 eye contact, 141
- fairness, sense of, 199  
 fast mapping, 191  
 fatal dog attacks  
   risk factors for, 174  
 fearfulness, 73, 218, 232, 279, 283, 406  
   development of, 106–8  
 feral dogs, 136, 146, 202, 308, 320, 343, 357  
 feralization, 344  
 fibroblast growth factor, 37  
 fighting dogs, 166, 167, 171, 311  
   gameness in, 168  
 Fila Brasileiro, 311  
 flat-coated retriever, 72  
 flooding, 220  
 fluoxetine, 241  
 folklore, 303, 309  
 founder effect, 70  
 fox, 95, 107, 336  
   early burial with human, 14  
   ecology, 320  
   farm experiment, 11, 28–9, 57, 70, 81, 84, 163, 337  
 fox terrier, 105  
 free-roaming dogs, 104, 105, 202, 301, 308, 320, 343, 370, 386, 409  
   activity patterns in, 355, 362  
   as competitors with wildlife, 376  
   as disease vectors, 375  
   causes of mortality in, 337, 352  
   conflict/competition with wolves, 364  
   conservation impact of, 370–80, 410  
   ecological constraints on, 334, 388  
   foraging behavior, 330, 354  
   home ranges of, 329, 348, 352, 361  
   mating systems of, 135, 352  
   predation on wildlife by, 363, 374, 389  
   pup survival in, 360  
   reproductive behavior of, 331, 351, 359  
   social organization, 135, 350, 407  
   wildlife disturbance by, 376  
 French bulldog, 144, 411
- gait  
   in sled dogs, 48  
 gene expression, 83, 94  
 gene mapping, 35, 36, 74–7  
 gene substitution, 9  
 genetic disease  
   dogs as models for, 23  
 genetic drift, 70

- genetic mutation, 9, 55  
 genetic polymorphism, 76  
 genetic testing, 278  
 genetics  
   and welfare problems, 275  
   of behavior, 70–87, 107, 163, 166  
   of hair structure, 37–8  
   of miniature body size, 35  
   of piebald coloring, 35  
   of short legs, 37  
 genome-wide association studies (GWAS), 27, 75, 79–81  
 German shepherd dog, 47, 59, 60, 62, 74, 78, 101, 105, 109, 110, 122, 168, 234, 321  
 glucocorticoids, 95, 96  
 golden retriever, 233, 256  
 Goyet Cave, 9  
 Great Dane, 275  
 Great Pyrenees, 44  
 greyhound, 164  
 grooming behavior, 96  
 growling, 147  
 guarding behavior, 164  
 guide dogs. *See* service dogs  
 guilt, 198
- Hayonim Terrace, 14  
 hearing dogs. *See* service dogs  
 heat-exhaustion, 49  
 herding dogs, 43, 50–2, 405  
 heritability, 71–4, 86  
 Hinduism, 308  
 hip dysplasia, 166  
 house-soiling. *See* eliminative behavior  
 howling, 108  
 hunter-gatherer, 17, 31, 302  
 hunting  
   behavior of dogs, 34, 51, 405  
   with dogs, 17, 18, 302  
 hybrid vigor, 45  
 hybridization, 33, 56, 364, 377  
 hypomethylation, 84  
 hypothalamo-pituitary-adrenal axis, 95, 97, 101, 107, 166
- Ice Age, 9  
 Iditarod race, 46  
 imitation, 187  
 impulsivity, 78  
 inbreeding  
   effects of, 33, 276  
 inhibitory control. *See* impulsivity  
 insulin-like growth factor, 35, 81  
 interbreeding  
   between dingoes and European dogs, 18  
   between dogs and wild canids, 377, 410  
   between dogs and wolves, 16, 27, 50, 364  
 Irish wolfhound, 122  
 Italian marenna, 44, 321, 336
- Jack Russell terrier, 47, 169, 234  
 Japanese tosa, 311  
 Jivaro, 303  
 juvenile period, 101
- kelpie, 51  
 kennel dog syndrome, 107  
 kennel housing, 285  
   aggression in, 288  
   environmental enrichment in, 288  
   social enrichment in, 287  
   space allowance, 285
- Kenyah, 309  
 Kesslerloch Cave, 12  
 Khoikhoi, 17  
 Koster, 16  
 Kung San, 17
- Labrador retriever, 62, 109, 233, 256, 281  
 lactation, 96  
 landrace, 44, 46  
 last glacial maximum (LGM), 9  
 learning theory, 215  
 line-breeding, 32  
 linkage analysis, 75  
 Lisu, 308  
 livestock guarding dogs, 43–6, 405  
 London, Jack, 50  
 Lorenz, Konrad, 161, 228
- Mahabharata, 308  
 Maltese terrier, 411  
 Maremmano–Abruzzese. *See* Italian marenna  
 mastiff, 33, 122  
 Matinen, 303, 304  
 Melanesia, 17  
 Mesolithic, 12, 54  
 miniature pinscher, 256  
 mobbing, 45  
 molecular clock, 28  
 molecular genetics, 23, 408  
   and origins of the dog, 30–1, 405  
 momentary distal pointing, 193  
 Monks of New Skete, 213  
 Most, Konrad, 212  
 mutilation. *See* cosmetic surgery
- narcolepsy, 86  
 Native American  
   dog breeds, 16, 46  
 Natufian, 13  
 Natural selection, 26, 43, 55, 336  
 Navajo, 45
- neglect, 279  
 Neolithic, 28, 54  
 neonatal period, 95–7  
 neophobia, 107  
 neoteny. *See* pedomorphosis  
 neural crest, 57, 405  
 neutering  
   and dog population control, 391  
   benefits of, 285  
   effects on behavior, 130, 165, 234, 241  
   public resistance to, 165
- New Guinea, 17  
   singing dog, 18, 30  
 New World dogs, 32  
 New Zealand huntaway, 51  
 Newfoundland, 46, 122  
 Nuala, 303
- obesity in dogs, 281  
 object permanence, 99  
 offspring-parent regressions, 72  
 olfaction, 148, 291  
 olfactory recognition, 148  
 Onges, 302  
 oxytocin, 96, 99, 408
- Paleolithic hunting methods, 13  
 Panaré, 303  
 parental care, 135, 336  
 pariah dog. *See* village dogs  
 parvovirus, 376  
 pastoral societies, 45  
 paternal half-sib correlations, 72  
 Pavlov, Ivan, 228  
 Pedigree Dogs Exposed, 276  
 pedomorphosis, 59, 405  
 personality, 78, 120, 174  
   definition of, 73  
 phenotype, 97  
   behavioral, 82, 405, 406, 408  
 pheromones, 149, 241  
 phobias, 232  
   treatment for, 238  
 phylogenetic tree, 30, 34  
 piloerection, 141  
 pit bull terrier, 74, 166, 170, 311  
 play, 106, 121, 150, 199, 336  
   dog-human, 251  
   signaling, 150  
 play-bow, 52  
 Pleistocene, 8  
   megafauna, 9, 31  
 poodle, 100, 101  
 popular sire effect, 33  
 predation  
   by free-roaming dogs, 345, 354, 363  
   effects on free-roaming dogs, 335  
   of dogs by leopards, 375

- predators  
 behavior of, 45  
 Pledmostí Cave, 9  
 preference tests, 274  
 prenatal period, 95  
 progeny selection, 72  
 psychopharmacology, 241  
 psychopomp  
 dog as, 307, 313  
 puberty, 33, 101  
 pug, 276  
 punctuated equilibrium, 55  
 punishment, 220  
 effects on learning, 220  
 negative, 215  
 positive, 215, 239, 407  
 puppy mills/farms, 166, 170, 176
- quality of life. *See* welfare  
 quantitative trait, 75  
 questionnaire surveys, 78, 119, 120, 169, 235, 406
- rabies, 343, 370, 375, 378, 389, 391, 397, 400, 410  
 radio tracking, 347  
 radiocarbon dating, 28  
 radio-tracking, 325, 345  
 Razboinichya Cave, 9  
 reinforcement, 230  
 negative, 215  
 positive, 215, 219, 407  
 relinquishment, 390, 406  
 of dogs to shelters, 281, 310  
 statistics, 281
- Resource Dispersion Hypothesis (RDH), 320  
 Resource Holding Potential (RHP), 138  
 response substitution, 217, 239  
 responsible pet ownership, 165, 176, 391  
 restraint  
 effects on behavior, 171  
 Romanes, George, 228  
 Rottweiler, 74, 122, 173, 234, 310  
 Ruma, 304
- sacrifice  
 of dogs, 306, 307  
 Saint Bernard, 47, 50, 122  
 scavenging behavior, 308  
 scent-marking, 150  
 Seamer Carr, 13  
 seizure alert dogs. *See* service dogs  
 sensitive periods, 44, 60–2, 94, 98, 100, 103, 106, 108, 170  
 separation-related anxiety, 106, 232, 280, 301  
 development of, 108–10  
 serotonin, 78, 83, 166
- service dogs, 252–4  
 laws and regulations pertaining to, 253  
 negative impacts, 258  
 working roles, 255
- sex differences  
 in behavior, 105, 127, 165, 355
- shar-pei, 122  
 Shetland sheepdog, 105, 122, 168  
 shiba inu, 122  
 Shipibo, 303  
 shock collars, 221  
 Siberian husky, 47, 122, 170, 411  
 sighthound, 32  
 single nucleotide polymorphisms (SNPs), 30, 31, 75  
 Sioux, 306  
 Skinner, B. F., 212, 228  
 sled dogs, 43, 46–50, 72, 171, 405  
 snowballing, 49  
 social cognition, 183–203, 407, 408  
 social learning, 185, 211  
 social perspective taking, 195  
 social referencing, 185  
 socialization, 44, 55, 96, 98–101, 103, 302, 406, 409  
 importance to welfare, 279  
 influence on aggression, 170  
 socialization period, 98–101, 106, 107, 302
- species  
 definition of, 8  
 Staffordshire bull terriers, 101  
 Star Carr, 12  
 stereotypic behavior  
 as indicator of poor welfare, 273
- sterilization. *See* neutering
- stress  
 behavioral indicators of, 273  
 in early life, 95, 96  
 physiological indicators of, 275  
 stress hormones, 95, 96  
 submission. *See* appeasement behavior  
 syringomyelia, 277
- tail-chasing, 70, 101, 233  
 tail-docking, 284  
 tail-wagging, 45, 141  
 temperament  
 definition of, 73  
 territorial behavior, 102, 121, 150, 354  
 in free-roaming dogs, 329  
 tethering. *See* restraint  
 theory of mind, 138, 194  
 therapy dogs, 252  
 Tinbergen, Nikolaas, 228, 230  
 trainability, 121  
 training methods, 184, 202, 211–23, 407  
 and choice of trainers, 218
- and social learning, 190  
 aversive, 211, 212  
 influence on behavior problems, 172, 218  
 reward-based, 211  
 using “clickers” as secondary reinforcers, 212
- transition period, 97  
 tryptophan, 167
- vaccination, 378, 397  
 variable number of tandem repeats (VNTRs), 75  
 Vedda, 303  
 village dogs, 17, 27, 31, 45, 104, 105, 146, 308, 325, 337, 343  
 social organization of, 326
- vision, 140, 291  
 von Stephanitz, Max, 59  
*Vulpes vulpes*. *See* fox
- weaning, 101  
 weimaraner, 189
- welfare  
 assessment of, 272  
 behavioral indicators of, 273  
 definition of, 272  
 during transport, 292  
 of dogs, 272–93, 310, 370, 389, 397, 408  
 of purebred dogs, 275, 409  
 physiological indicators of, 275
- whippet, 164  
 wolf, 8, 321  
 domestication, 9, 27, 31  
 dominance in, 104, 134, 166, 407  
 evolution, 23, 407  
 hunting behavior, 60  
 predation on dogs, 335, 358, 375  
 pup development, 97, 104  
 social cognition, 203  
 social organization, 134, 203  
 socialization, 98, 100  
 territorial behavior in, 103  
 working dogs, 43, 85, 95, 97, 100, 119, 211, 406, 409
- xoloitzcuintli, 16
- Yangtze River, 16, 30  
 yawning, 197  
 Yorkshire terrier, 233  
 Yudhishthira, legend of, 308  
 Yurok, 303, 312
- zoonoses, 375, 389, 397, 410