

CONTENTS

In Memoriam	v
Preface	vii–viii
Section Editors	ix–xiv
Contributors	xv–xxiv
Guide to Use of the Encyclopedia	xxv
Subject Classification	xxvii–xxxi

VOLUME 1

A

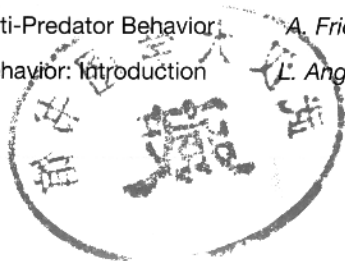
Acoustic Communication in Insects: Neuroethology	G. S. Pollack	1
Acoustic Signals	A. M. Simmons	7
Active Electoreception: Vertebrates	G. von der Emde	16
Adaptive Landscapes and Optimality	C. J. Goodnight	24
Aggression and Territoriality	B. C. Trainor and C. A. Marler	30
Agonistic Signals	C. R. Gabor	35
Alarm Calls in Birds and Mammals	C. N. Slobodchikoff	40
Alex: A Study in Avian Cognition	I. M. Pepperberg	44
Amphibia: Orientation and Migration	U. Sinsch	50
Animal Arithmetic	J. F. Cantlon and E. M. Brannon	55
Animal Behavior: Antiquity to the Sixteenth Century	L. C. Drickamer	63
Animal Behavior: The Seventeenth to the Twentieth Centuries	L. C. Drickamer	68
Ant, Bee and Wasp Social Evolution	R. Gadagkar	73
Anthropogenic Noise: Impacts on Animals	H. Slabbekoorn	82
Anthropogenic Noise: Implications for Conservation	H. Brumm	89
Antipredator Benefits from Heterospecifics	E. Goodale and G. D. Ruxton	94
Apes: Social Learning	A. Whiten	100
Aplysia	J. F. Aggio and C. D. Derby	107
Aquatic Invertebrate Endocrine Disruption	E. Zou	112
Avian Social Learning	L. Lefebvre and N. J. Boogert	124
Avoidance of Parasites	D. W. Thieltges and R. Poulin	131

B

Barn Swallows: Sexual and Social Behavior	<i>R. Safran</i>	139
Bat Migration	<i>T. H. Fleming</i>	145
Bat Neuroethology	<i>G. D. Pollak</i>	150
Bateman's Principles: Original Experiment and Modern Data For and Against	<i>Z. Tang-Martínez</i>	166
Bats: Orientation, Navigation and Homing	<i>R. A. Holland</i>	177
Behavioral Ecology and Sociobiology	<i>J. L. Brown</i>	186
Behavioral Endocrinology of Migration	<i>M. Ramenofsky</i>	191
<i>Betta Splendens</i>	<i>C. V. Tillberg</i>	200
Beyond Fever: Comparative Perspectives on Sickness Behavior	<i>B. L. Hart</i>	205
Bird Migration	<i>S. A. Gauthreaux, Jr.</i>	211
Body Size and Sexual Dimorphism	<i>R. M. Cox</i>	220
Boobies	<i>H. Drummond</i>	226
Bowerbirds	<i>C. B. Frith</i>	233

C

Caching	<i>A. Brodin</i>	241
Caste Determination in Arthropods	<i>A. G. Dolezal</i>	247
Caste in Social Insects: Genetic Influences Over Caste Determination	<i>N. Lo, M. Beekman, and B. P. Oldroyd</i>	254
Categories and Concepts: Language-Related Competences in Non-Linguistic Species	<i>L. Huber</i>	261
Chimpanzees	<i>J. C. Mitani</i>	267
Circadian and Circannual Rhythms and Hormones	<i>L. Ruggiero and R. Silver</i>	274
Cockroaches	<i>C. A. Nalepa</i>	281
Co-Evolution of Predators and Prey	<i>E. D. Brodie, III and A. Wilkinson</i>	287
Cognitive Development in Chimpanzees	<i>T. Matsuzawa</i>	296
Collective Intelligence	<i>S. C. Pratt</i>	303
Colony Founding in Social Insects	<i>J. C. Choe</i>	310
Communication and Hormones	<i>G. T. Smith</i>	317
Communication Networks	<i>M. D. Greenfield</i>	329
Communication: An Overview	<i>J. Lucas and T. M. Freeberg</i>	337
Comparative Animal Behavior – 1920–1973	<i>G. M. Burghardt</i>	340
Compensation in Reproduction	<i>P. A. Gowaty</i>	345
Conflict Resolution	<i>O. N. Fraser and F. Aureli</i>	350
Consensus Decisions	<i>L. Conradt, T. J. Roper, and C. List</i>	355
Conservation and Animal Behavior	<i>R. Swaisgood</i>	359
Conservation and Anti-Predator Behavior	<i>A. Frid and M. R. Heithaus</i>	366
Conservation and Behavior: Introduction	<i>L. Angeloni, K. R. Crooks, and D. T. Blumstein</i>	377



Conservation Behavior and Endocrinology	<i>L. S. Hayward and D. S. Busch</i>	382
Conservation, Behavior, Parasites and Invasive Species	<i>S. Bevins</i>	392
Cooperation and Sociality	<i>T. N. Sherratt and D. M. Wilkinson</i>	396
Cost-Benefit Analysis	<i>R. R. Ha</i>	402
Costs of Learning	<i>E. C. Snell-Rood</i>	406
Crabs and Their Visual World	<i>J. Zeil and J. M. Hemmi</i>	411
Crustacean Social Evolution	<i>J. E. Duffy</i>	421
Cryptic Female Choice	<i>W. G. Eberhard</i>	430
Cultural Inheritance of Signals	<i>T. M. Freeberg</i>	435
Culture	<i>S. Perry</i>	440

D

Dance Language	<i>F. C. Dyer</i>	445
Darwin and Animal Behavior	<i>R. A. Boakes</i>	454
Deception: Competition by Misleading Behavior	<i>R. W. Byrne</i>	461
Decision-Making: Foraging	<i>S. D. Healy and K. Morgan</i>	466
Decision-Making and Learning: The Peak Shift Behavioral Response	<i>S. K. Lynn</i>	470
Defensive Avoidance	<i>W. J. Boeing</i>	476
Defensive Chemicals	<i>B. Clucas</i>	481
Defensive Coloration	<i>G. D. Ruxton</i>	487
Defensive Morphology	<i>J. M. L. Richardson and B. R. Anholt</i>	493
Development, Evolution and Behavior	<i>A. L. Toth</i>	500
Developmental Plasticity	<i>A. R. Smith</i>	507
<i>Dictyostelium</i> , the Social Amoeba	<i>J. E. Strassmann</i>	513
Differential Allocation	<i>N. T. Burley</i>	520
Digestion and Foraging	<i>C. J. Whelan</i>	526
Disease Transmission and Networks	<i>D. Naug</i>	532
Disease, Behavior and Welfare	<i>B. V. Beaver</i>	537
Distributed Cognition	<i>L. Barrett</i>	543
Division of Labor	<i>J. H. Fewell</i>	548
Dolphin Signature Whistles	<i>L. S. Sayigh and V. M. Janik</i>	553
Domestic Dogs	<i>B. Smuts</i>	562
Dominance Relationships, Dominance Hierarchies and Rankings	<i>I. S. Bernstein</i>	568
<i>Drosophila</i> Behavior Genetics	<i>R. Yamada and E. A. McGraw</i>	573

E

Ecology of Fear	<i>J. S. Brown</i>	581
Economic Escape	<i>W. E. Cooper, Jr.</i>	588



Ectoparasite Behavior	<i>M. J. Klowden</i>	596
Electrical Signals	<i>P. K. Stoddard</i>	601
Electroreception in Vertebrates and Invertebrates	<i>S. P. Collin</i>	611
Emotion and Social Cognition in Primates	<i>L. A. Parr</i>	621
Empathetic Behavior	<i>F. B. M. de Waal</i>	628
Empirical Studies of Predator and Prey Behavior	<i>W. Cresswell</i>	633
Endocrinology and Behavior: Methods	<i>K. L. Ayres</i>	639
Ethograms, Activity Profiles and Energy Budgets	<i>I. S. Bernstein</i>	645
Ethology in Europe	<i>M. Taborsky</i>	649
Evolution and Phylogeny of Communication	<i>T. J. Ord</i>	652
Evolution of Parasite-Induced Behavioral Alterations	<i>F. Thomas, T. Rigaud, and J. Brodeur</i>	661
Evolution: Fundamentals	<i>J. M. Herbers</i>	670
Experiment, Observation, and Modeling in the Lab and Field	<i>K. Yasukawa</i>	679
Experimental Approaches to Hormones and Behavior: Invertebrates	<i>S. E. Fahrbach</i>	686
Experimental Design: Basic Concepts	<i>C. W. Kuhar</i>	693

F

Female Sexual Behavior and Hormones in Non-Mammalian Vertebrates	<i>D. L. Maney</i>	697
Field Techniques in Hormones and Behavior	<i>L. Fusani</i>	704
Fight or Flight Responses	<i>L. M. Romero</i>	710
Fish Migration	<i>R. D. Grubbs and R. T. Kraus</i>	715
Fish Social Learning	<i>J.-G. J. Godin</i>	725
Flexible Mate Choice	<i>M. Ah-King</i>	730
Food Intake: Behavioral Endocrinology	<i>T. Boswell</i>	738
Food Signals	<i>C. T. Snowdon</i>	744
Foraging Modes	<i>D. Raubenheimer</i>	749
Forced or Aggressively Coerced Copulation	<i>P. A. Gowaty</i>	759
Future of Animal Behavior: Predicting Trends	<i>L. C. Drickamer and P. A. Gowaty</i>	764
Glossary		771

VOLUME 2**G**

Game Theory	<i>K. Yasukawa</i>	1
Games Played by Predators and Prey	<i>A. Bouskila</i>	6
Genes and Genomic Searches	<i>C. P. Kyriacou and E. Tauber</i>	12
Group Living	<i>G. Beauchamp</i>	21
Group Movement	<i>I. D. Couzin and A. J. King</i>	25

H

Habitat Imprinting	<i>J. M. Davis</i>	33
Habitat Selection	<i>I. M. Hamilton</i>	38
William Donald Hamilton	<i>M. J. West-Eberhard</i>	44
Hearing: Insects	<i>D. Robert</i>	49
Hearing: Vertebrates	<i>F. Ladich</i>	54
Helpers and Reproductive Behavior in Birds and Mammals	<i>J. Komdeur</i>	61
Herring Gulls	<i>J. Burger</i>	70
Hibernation, Daily Torpor and Estivation in Mammals and Birds: Behavioral Aspects	<i>F. Geiser</i>	77
Honest Signaling	<i>P. L. Hurd</i>	84
Honeybees	<i>M. D. Breed</i>	89
Hormones and Behavior: Basic Concepts	<i>R. J. Nelson</i>	97
Hormones and Breeding Strategies, Sex Reversal, Brood Parasites, Parthenogenesis	<i>C. Rowe</i>	106
Horses: Behavior and Welfare Assessment	<i>B. V. Beaver</i>	112
Hunger and Satiety	<i>D. Raubenheimer and S. J. Simpson</i>	117

I

Imitation: Cognitive Implications	<i>T. R. Zentall</i>	127
Immune Systems and Sickness Behavior	<i>J. S. Adelman and L. B. Martin</i>	133
Infanticide	<i>C. P. van Schaik and M. A. van Noordwijk</i>	138
Information Content and Signals	<i>J. P. Hailman</i>	144
Innovation in Animals	<i>K. N. Laland and S. M. Reader</i>	150
Insect Flight and Walking: Neuroethological Basis	<i>R. E. Ritzmann and John A. Bender</i>	155
Insect Migration	<i>J. W. Chapman and V. A. Drake</i>	161
Insect Navigation	<i>P. Graham</i>	167
Insect Social Learning	<i>R. Dukas</i>	176
Integration of Proximate and Ultimate Causes	<i>S. H. Vessey and L. C. Drickamer</i>	180
Intermediate Host Behavior	<i>J. Moore</i>	186
Internal Energy Storage	<i>A. Brodin</i>	191
Interspecific Communication	<i>I. Krams</i>	196
Intertemporal Choice	<i>J. R. Stevens</i>	203
Invertebrate Hormones and Behavior	<i>E. S. Chang</i>	209
Invertebrates: The Inside Story of Post-Insemination, Pre-Fertilization Reproductive Interactions	<i>T. A. Markow</i>	216
Irruptive Migration	<i>I. Newton</i>	221
Isolating Mechanisms and Speciation	<i>M. R. Servedio</i>	230

K

Kin Recognition and Genetics	<i>A. Payne, P. T. Starks, and A. E. Liebert</i>	237
Kin Selection and Relatedness	<i>D. C. Queller</i>	247
Kleptoparasitism and Cannibalism	<i>K. Nishimura</i>	253

L

Learning and Conservation	<i>A. S. Griffin</i>	259
Leech Behavioral Choice: Neuroethology	<i>W. B. Kristan, Jr. and K. A. French</i>	265
Levels of Selection	<i>M. M. Patten</i>	272
Life Histories and Network Function	<i>T. G. Manno</i>	277
Life Histories and Predation Risk	<i>P. A. Bednekoff</i>	283
Locusts	<i>A. V. Latchininsky</i>	288
Konrad Lorenz	<i>R. W. Burkhardt, Jr.</i>	298

M

Magnetic Compasses in Insects	<i>A. J. Riveros and R. B. Srygley</i>	305
Magnetic Orientation in Migratory Songbirds	<i>M. E. Deutschlander and R. Muheim</i>	314
Magnetoreception	<i>G. Fleissner and G. Fleissner</i>	324
Male Ornaments and Habitat Deterioration	<i>U. Candolin</i>	336
Male Sexual Behavior and Hormones in Non-Mammalian Vertebrates	<i>J. Balthazart and G. F. Ball</i>	340
Mammalian Female Sexual Behavior and Hormones	<i>A. S. Kauffman</i>	355
Mammalian Social Learning: Non-Primates	<i>B. G. Galef</i>	370
Maps and Compasses	<i>P. J. Fraser</i>	375
Marine Invertebrates: Genetics of Colony Recognition	<i>R. Grosberg and D. Plachetzki</i>	381
Mate Choice and Learning	<i>E. A. Hebets and L. Sullivan-Beckers</i>	389
Mate Choice in Males and Females	<i>I. Ahnesjö</i>	394
Maternal Effects on Behavior	<i>H. Schwabl and T. G. G. Groothuis</i>	399
Mating Interference Due to Introduction of Exotic Species	<i>A. Valero</i>	412
Mating Signals	<i>H. C. Gerhardt</i>	416
Measurement Error and Reliability	<i>S. W. Margulis</i>	424
Memory, Learning, Hormones and Behavior	<i>V. V. Pravosudov</i>	429
Mental Time Travel: Can Animals Recall the Past and Plan for the Future?	<i>N. S. Clayton and A. Dickinson</i>	438
Metacognition and Metamemory in Non-Human Animals	<i>R. R. Hampton</i>	443
Microevolution and Macroevolution in Behavior	<i>J. E. Leonard and C. R. B. Boake</i>	449
Migratory Connectivity	<i>P. P. Marra, C. E. Studds, and M. Webster</i>	455
Molt in Birds and Mammals: Hormones and Behavior	<i>J. C. Wingfield and B. Silverin</i>	462
Monkeys and Prosimians: Social Learning	<i>D. M. Fragaszy and J. Crast</i>	468

Monogamy and Extra-Pair Parentage	<i>H. Hoi and M. Griggio</i>	475
Morality and Evolution	<i>K. McAuliffe and M. Hauser</i>	483
Motivation and Signals	<i>D. H. Owings</i>	489
Multimodal Signaling	<i>G. W. Uetz</i>	494

N

Naked Mole Rats: Their Extraordinary Sensory World	<i>T. J. Park, G. R. Lewin, and R. Buffenstein</i>	505
Nasonia Wasp Behavior Genetics	<i>R. Watt and D. M. Shuker</i>	513
Nematode Learning and Memory: Neuroethology	<i>C. H. Lin and C. H. Rankin</i>	520
Nervous System: Evolution in Relation to Behavior	<i>J. E. Niven</i>	527
Nest Site Choice in Social Insects	<i>S. C. Pratt</i>	534
Neural Control of Sexual Behavior	<i>D. Crews</i>	541
Neurobiology, Endocrinology and Behavior	<i>E. Adkins-Regan and C. S. Carter</i>	549
Neuroethology: Methods	<i>S. S. Burmeister</i>	557
Neuroethology: What is it?	<i>M. Konishi</i>	562
Non-Elemental Learning in Invertebrates	<i>M. Giurfa, A. Avarguès-Weber, and R. Menzel</i>	566
Norway Rats	<i>B. G. Galef</i>	573

O

Octopus	<i>J. A. Mather</i>	579
Olfactory Signals	<i>M. D. Ginzl</i>	584
Ontogenetic Effects of Captive Breeding	<i>J. L. Kelley and C. M. Garcia</i>	589
Optimal Foraging and Plant-Pollinator Co-Evolution	<i>G. H. Pyke</i>	596
Optimal Foraging Theory: Introduction	<i>G. H. Pyke</i>	601
Orthopteran Behavioral Genetics	<i>Y. M. Parsons</i>	604

P

Pair-Bonding, Mating Systems and Hormones	<i>W. Goymann</i>	611
Parasite-Induced Behavioral Change: Mechanisms	<i>M.-J. Perrot-Minnot and F. Cézilly</i>	618
Parasite-Modified Vector Behavior	<i>H. Hurd</i>	628
Parasites and Insects: Aspects of Social Behavior	<i>M. J. F. Brown</i>	632
Parasites and Sexual Selection	<i>A. Jacobs and M. Zuk</i>	636
Parasitoid Wasps: Neuroethology	<i>F. Libersat</i>	642
Parasitoids	<i>L. M. Henry and B. D. Roitberg</i>	651
Parental Behavior and Hormones in Mammals	<i>K. E. Wynne-Edwards</i>	657
Parental Behavior and Hormones in Non-Mammalian Vertebrates	<i>J. D. Buntin</i>	664
Parent-Offspring Signaling	<i>A. G. Horn and M. L. Leonard</i>	672

<i>Parmecium</i> Behavioral Genetics	J. L. Van Houten, M. Valentine, and J. Yano	677
Patch Exploitation	P. Nonacs	683
Pets: Behavior and Welfare Assessment	B. L. Sherman	691
<i>Pheidole</i> : Sociobiology of a Highly Diverse Genus	J. Traniello	699
Phylogenetic Inference and the Evolution of Behavior	K. M. Pickett	707
Pigeon Homing as a Model Case of Goal-Oriented Navigation	H. G. Wallraff	713
Pigeons	C. A. Stern and J. L. Dickinson	723
Pigs: Behavior and Welfare Assessment	J. Deen	731
Play	G. M. Burghardt	740
Playbacks in Behavioral Experiments	G. G. Rosenthal	745
Poultry: Behavior and Welfare Assessment	J. A. Linares and M. Martin	750
Predator Avoidance: Mechanisms	R. G. Coss	757
Predator Evasion	D. D. Yager	765
Predator's Perspective on Predator-Prey Interactions	S. Creel	774
Problem-Solving in Tool-Using and Non-Tool-Using Animals	A. M. Seed and J. Call	778
Propagule Behavior and Parasite Transmission	P. H. L. Lamberton, A. J. Norton, and J. P. Webster	786
Psychology of Animals	D. A. Dewsbury	792
Punishment	K. Jensen and M. Tomasello	800
Glossary		807

VOLUME 3

Q

Queen-Queen Conflict in Eusocial Insect Colonies	M. A. D. Goodisman	1
Queen-Worker Conflicts Over Colony Sex Ratio	N. J. Mehdiabadi	7

R

Rational Choice Behavior: Definitions and Evidence	M. Bateson	13
Recognition Systems in the Social Insects	A. Payne and P. T. Starks	20
Referential Signaling	C. S. Evans and J. A. Clarke	27
Remote-Sensing of Behavior	N. Pinter-Wollman and K. E. Mabry	33
Reproductive Behavior and Parasites: Invertebrates	J. C. Shaw	41
Reproductive Behavior and Parasites: Vertebrates	H. Richner	49
Reproductive Skew	S.-F. Shen and H. K. Reeve	54
Reproductive Skew, Cooperative Breeding, and Eusociality in Vertebrates: Hormones	W. Saltzman	59
Reproductive Success	J. Moreno	64
Rhesus Macaques	D. Maestripieri	70
Risk Allocation in Anti-Predator Behavior	E. Fernández-Juricic and I. Rodríguez-Prieto	75

Risk-Taking in Self-Defense	<i>T. Stankowich</i>	79
Robot Behavior	<i>E. S. Fortune and N. J. Cowan</i>	87
Robotics in the Study of Animal Behavior	<i>G. L. Patricelli</i>	91

S

Sea Turtles: Navigation and Orientation	<i>C. M. F. Lohmann and K. J. Lohmann</i>	101
Seasonality: Hormones and Behavior	<i>N. L. McGuire, R. M. Calisi, and G. E. Bentley</i>	108
Seed Dispersal and Conservation	<i>E. V. Wehncke</i>	119
Self-Medication: Passive Prevention and Active Treatment	<i>M. A. Huffman</i>	125
Sentience	<i>L. Marino</i>	132
Sequence Analysis and Transition Models	<i>A. Berchtold</i>	139
Sex Allocation, Sex Ratios and Reproduction	<i>I. C. W. Hardy</i>	146
Sex and Social Evolution	<i>K. Matsuura</i>	152
Sex Change in Reef Fishes: Behavior and Physiology	<i>J. Godwin</i>	160
Sex Changing Organisms and Reproductive Behavior	<i>R. R. Warner</i>	167
Sexual Behavior and Hormones in Male Mammals	<i>J. Bakker</i>	170
Sexual Selection and Speciation	<i>G. F. Grether</i>	177
Sharks	<i>M. R. Heupel</i>	184
Signal Parasites	<i>J. Alcock</i>	192
Slaughter Plants: Behavior and Welfare Assessment	<i>T. Grandin</i>	197
Sleep and Hormones	<i>J. M. Krueger, É. Szentirmai, and L. Kapás</i>	203
Smell: Vertebrates	<i>K. B. Døving</i>	207
Social Behavior and Parasites	<i>S. L. Klein and R. J. Nelson</i>	216
Social Cognition and Theory of Mind	<i>J. Kaminski and N. J. Emery</i>	226
Social Evolution in 'Other' Insects and Arachnids	<i>J. T. Costa</i>	231
Social Information Use	<i>J. Morand-Ferron, B. Doligez, S. R. X. Dall, and S. M. Reader</i>	242
Social Insects: Behavioral Genetics	<i>B. P. Oldroyd</i>	251
Social Learning: Theory	<i>K. N. Laland and L. Rendell</i>	260
Social Recognition	<i>M. D. Breed</i>	267
Social Selection, Sexual Selection, and Sexual Conflict	<i>J. P. Drury and P. A. Gowaty</i>	273
Sociogenomics	<i>C. M. Grozinger and G. E. Robinson</i>	281
Sound Localization: Neuroethology	<i>C. E. Carr</i>	286
Sound Production: Vertebrates	<i>R. A. Suthers</i>	293
Spatial Memory	<i>S. D. Healy and C. Jozet-Alves</i>	304
Spatial Orientation and Time: Methods	<i>K. E. Mabry and N. Pinter-Wollman</i>	308
Specialization	<i>D. J. Funk</i>	315
Sperm Competition	<i>N. Wedell</i>	322
Spiders: Social Evolution	<i>Y. Lubin</i>	329

Spotted Hyenas	<i>J. E. Smith and K. E. Holekamp</i>	335
Stress, Health and Social Behavior	<i>R. M. Sapolsky</i>	350
Subsociality and the Evolution of Eusociality	<i>T. A. Linksvayer</i>	358
Swordtails and Platyfishes	<i>G. G. Rosenthal</i>	363
Syntactically Complex Vocal Systems	<i>M. R. Bregman and T. Q. Gentner</i>	368

T

Tadpole Behavior and Metamorphosis	<i>R. J. Denver</i>	375
Taste: Invertebrates	<i>J. Reinhard</i>	379
Taste: Vertebrates	<i>C. J. L. Atkinson and S. P. Collin</i>	386
Termites: Social Evolution	<i>J. Korb</i>	394
Thermoreception: Invertebrates	<i>H. Schmitz and A. Schmitz</i>	401
Thermoreception: Vertebrates	<i>G. Westhoff</i>	409
Threespine Stickleback	<i>S. A. Foster</i>	413
Time: What Animals Know	<i>J. D. Crystal</i>	420
Niko Tinbergen	<i>R. W. Burkhardt, Jr.</i>	428
Trade-Offs in Anti-Predator Behavior	<i>P. A. Bednekoff</i>	434
Training of Animals	<i>L. I. Haug and A. Florsheim</i>	439
Tribolium	<i>A. Pai</i>	446
Túngara Frog: A Model for Sexual Selection and Communication	<i>M. J. Ryan</i>	453
Turtles: Freshwater	<i>R. M. Bowden</i>	462

U

Unicolonial Ants: Loss of Colony Identity	<i>K. Tsuji</i>	469
---	-----------------	-----

V

Vertebrate Endocrine Disruption	<i>M. A. Ottinger and K. Dean</i>	475
Vertical Migration of Aquatic Animals	<i>R. B. Forward, Jr. and J. H. Cohen</i>	485
Vibration Perception: Vertebrates	<i>J. C. Montgomery, S. P. Windsor, and D. K. Bassett</i>	491
Vibrational Communication	<i>R. B. Cocroft</i>	498
Vigilance and Models of Behavior	<i>J. Lind</i>	506
Vision: Invertebrates	<i>E. Warrant</i>	511
Vision: Vertebrates	<i>R. H. Douglas</i>	525
Visual Signals	<i>E. Fernández-Juricic</i>	544
Vocal Learning	<i>P. J. B. Slater and V. M. Janik</i>	551
Vocal-Acoustic Communication in Fishes: Neuroethology	<i>A. H. Bass and A. N. Rice</i>	558

W

Water and Salt Intake in Vertebrates: Endocrine and Behavioral Regulation	<i>D. Daniels and J. Schulkin</i>	569
Welfare of Animals: Behavior as a Basis for Decisions	<i>D. M. Broom</i>	580
Welfare of Animals: Introduction	<i>B. V. Beaver</i>	585
White-Crowned Sparrow	<i>D. A. Nelson</i>	590
Wintering Strategies	<i>B. Silverin and J. C. Wingfield</i>	597
Wintering Strategies: Molt and Behavior	<i>L.-A. Giraldeau</i>	606
Wolves	<i>J. M. Packard</i>	611
Worker-Worker Conflict and Worker Policing	<i>H. Helanterä and F. L. W. Ratnieks</i>	621

Z

Zebra Finches	<i>J. P. Swaddle</i>	629
Zebrafish	<i>J. R. Fetcho</i>	633
Zootomy		639
Glossary		703
Index		