Literature Cited

1 Adams, C. M., M. G. Anderson, D. G. Motto, M. P. Price, W. A. Johnson, and M. J. Welsh. 1998. Ripped pocket and pickpocket, novel Drosophila DEG/ENaC subunits expressed in early development and in mechanosensory neurons. *Journal of Cell Biology* 140: 143–152.

2 Adrianov, A. V. and V. V. Malakhov. 1995. Comparative morphological analysis of the organization of cephalorhynch worms, the phylogeny, and the system of the phylum Cenpahlorhyncha. 3. Sense organs, digestive system, and body cavity. *Zoologichesky Zhurnal* 74: 19–30.

3 Albert, J. S. and W. G. R. Crampton. 2005. Diversity and phylogeny of neotropical electric fishes (Gymnotiformes). In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 360–409. New York, NY: Springer Science+Business Media.

4 Alves-Gomes, J. A. 2001. The evolution of electroreception and bioelectrogenesis in teleost fish: a phylogenetic perspective. *Journal of Fish Biology* 58: 1489–1511.

5 Ameye, L., R. Hermann, P. Dubois, and P. Flammang. 2000. Ultrastructure of the echinoderm cuticle after fast-freezing/freeze substitution and conventional chemical fixations. *Microscopy Research and Technique* 48: 385–393.

6 Andres, K. H., M. Vonduring, and E. Petrasch. 1988. The fine structure of ampullary and tuberous electroreceptors in the South American blind catfish *Pseudocetopsis spec*. *Anatomy and Embryology* 177: 523–535.

7 Arnegard, M. E. and C. D. Hopkins. 2003. Electric signal variation among seven blunt-snouted *Brienomyrus* species (Teleostei : Mormyridae) from a riverine species flock in Gabon, Central Africa. *Environmental Biology of Fishes* 67: 321–339.

8 Asano, M. and I. Hanyu. 1987. Sensitivity to electricity in the catfish, *Parasilurus asotus*. *Comparative Biochemistry and Physiology A-Physiology* 86: 485–489.

9 Assad, C., B. Rasnow, and P. K. Stoddard. 1999. Electric organ discharges and electric images during electrolocation. *Journal of Experimental Biology* 202: 1185–1193.

10 Baird, R. W. 2000. The killer whale. In *Cetacean Societies: Field Studies of Dolphins and Whales* (J. Mann, R. C. Connor, P. L. Tyack, and H. Whitehead, eds.), pp. 127–153. Chicago, IL: University of Chicago Press.

11 Bardach, J. E. and L. A. Loewenthal. 1961. Touch receptors in fishes with special reference to moray eels (*Gymnotborax vicinus* and *G. moringa*). *Copeia* 42–46.

12 Baron, V. D. and N. A. Mikhailenko. 1976. *Uranoscopus scaber* - transitional form in evolution of electric organs in fishes. *Doklady Akademii Nauk Sssr* 229: 983–986.

13 Baron, V. D., K. S. Morshnev, V. M. Olshansky, and A. A. Orlov. 1994. Electric organ discharges of 2 species of African catfish (*Synodontis*) during social behavior. *Animal Behaviour* 48: 1472–1475.

14 Baron, V. D., A. A. Orlov, and A. S. Golubtsov. 1994. African *Clarias* catfish elicits long-lasting weak electric pulses. *Experientia* 50: 644–647.

15 Baron, V. D., A. A. Orlov, and A. S. Golubtsov. 1996. African catfishes Clariidae: A new group of weakly electrical fish. *Izvestiya Akademii Nauk Seriya Biologicheskaya* 106–111.

16 Baron, V. D., A. A. Orlov, and A. S. Golubtsov. 1996. Revealing of the electric discharges of the African catfish *Auchenoglanis occidentalis* (Siluriformes: Bagridae). *Doklady Akademii Nauk* 349: 565–567.

17 Barth, F. G. 2002. *A Spider's World: Senses and Behavior*. Berlin: Springer.

18 Barth, F. G. 2002. Spider senses - technical perfection and biology. *Zoology* 105: 271–285.

19 Bass, A. H. 1986. Electric organs revisted: evolution of a vertebrate communication and orientation organ. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 13–70. New York: John Wiley and Sons.

20 Bastian, J. 1986. Electrolocation: behavior, anatomy, and physiology. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 577–612. New York: John Wiley and Sons.

21 Bastian, J. and H. Zakon. 2005. Plasticity of sense organs and brain. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 195–228. New York, NY: Springer Science+Business Media.

22 Belbenoi, P. and R. Bauer. 1972. Video recordings of prey capture behavior and associated electric organ discharge of *Torpedo marmorata* (Chondrichthyes). *Marine Biology* 17: 93–99.

23 Bell, C. C. 1986. Electroreception in mormyrid fish. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 423–452. New York: John Wiley and Sons.

24 Bell, C. C. 1990. Mormyromast electroreceptor organs and their afferent fibers in mormyrid fish. III. Physiological differences between two morphological types of fibers. *Journal of Neurophysiology* 63: 319–332.

25 Bell, C. C. and L. Maler. 2005. Central neuroanatomy of electrosensory systems in fish. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 68–111. New York, NY: Springer Science+Business Media.

26 Bell, J., S. Bolanowski, and M. H. Holmes. 1994. The structure and function of Pacinian corpuscles- a review. *Progress in Neurobiology* 42: 79–128.

27 Bennett, M. V. and H. Grundfest. 1961. Electrophysiology of electric organs of marine electric fishes. 2. Electroplaques of main and accessory organs of *Narcine brasiliensis*. *Journal of General Physiology* 44: 805–818.

28 Bennett, M. V., H. Grundfest, and M. Wurzel. 1961. Electrophysiology of electric organs of marine electric fishes. 1. Properties of electroplaques of *Torpedo nobiliana*. *Journal of General Physiology* 44: 757–804.

29 Bennett, M. V. 1965. Electroreceptors in mormyrids. *Cold Spring Harbor Symposia in Quantitative Biology* 30: 245–262.

30 Bennett, M. V. 1971. Electric organs. In *Fish Physiology* (W. S. Hoar and W. Heiligenberg, eds.), pp. 347–491. New York, NY: Academic Press.

31 Bennett, M. V. L. 1970. Comparative physiology: electric organs. *Annual Review of Physiology* 32: 471–528.

32 Berg, T. O. and O. Sand. 1994. Spontaneous all-or-nothing potentials in the ciliate *Bursaridium difficile*. *Journal of Eukaryotic Microbiology* 41: 13–17.

33 Berkhoudt, H. 1980. The morphology and distribution of cutaneous mechanoreceptors (Herbst and Grandry corpuscles) in bill and tongue of the mallard (*Anas platyrhynchos* L). *Netherlands Journal of Zoology* 30: 1–34.

34 Birenheide, R. and T. Motokawa. 1997. Morphology of skeletal cortex in the arms of crinoids (Echinodermata : Crinoidea). *Zoological Science* 14: 753–761.

35 Bischof, C. 1996. Diversity in agonistic behavior of croaking gouramis (*Trichopsis vittata*, *T-schalleri*, and *T-pumila*; Anabantoidei) and the paradise fish (*Macropodus opercularis*; Anabantoidei). *Aggressive Behavior* 22: 447–455.

36 Bleckmann, H. 1994. *Reception of hydrodynamic stimuli in aquatic and semiaquatic animals*. Stuttgart: Fischer.

37 Bleckmann, H. 2007. The lateral line system of fish. In *Sensory Systems and Neuroscience, Vol. 25, Fish Physiology Series* (T. J. Hara and B. S. Zielinski, eds.), pp. 411–453. New York: Elsevier/Academic Press.

38 Blickhan, R., C. Krick, D. Zehren, W. Nachtigall, and T. Breithaupt. 1992. Generation of a vortex chain in the wake of a subundulatory swimmer. *Naturwissenschaften* 79: 220–221.

39 Blouin-Demers, G., K. A. Prior, and P. J. Weatherhead. 2000. Patterns of variation in spring emergence by black rat snakes (*Elaphe obsoleta obsoleta*). *Herpetologica* 56: 175–188.

40 Blumer, R., K. Z. Konakci, P. C. Brugger, M. Josef, F. Blumer, D. Moserc, C. Schoefer, J. R. Lukas, and J. Streicher. 2003. Muscle spindles and Golgi tendon organs in bovine calf extraocular muscle studied by means of double-fluorescent labeling, electron microscopy, and three-dimensional reconstruction. *Experimental Eye Research* 77: 447–462.

41 Bodznick, D. and R. G. Northcutt. 1981. Electroreception in lampreys - evidence that the earliest vertebrates were electroreceptive. *Science* 212: 465–467.

42 Bodznick, D. and R. L. Boord. 1986. Electroreception in chondrichthyes. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 225–256. New York: John Wiley and Sons.

43 Bodznick, D. and J. C. Montgomery. 2005. The physiology of low-frequency electrosensory systems. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 132–153. New York, NY: Springer Science+Business Media.

44 Boggemann, M., D. Fiege, and G. Purschke. 2000. Ultrastructure of the proboscidial papillae in some Glycera species (Annelida : Polychaeta : Glyceridae). *Cahiers De Biologie Marine* 41: 143–153.

45 Bolanowski, S. J. and L. Pawson. 2003. Organization of Meissner corpuscles in the glabrous skin of monkey and cat. *Somatosensory and Motor Research* 20: 223–231.

46 Bonnevier, K., K. Lindstrom, and C. S. Mary. 2003. Parental care and mate attraction in the Florida flagfish, *Jordanella floridae*. *Behavioral Ecology and Sociobiology* 53: 358–363.

47 Boyan, G. S. and E. E. Ball. 1989. The wind-sensitive cercal receptor giant interneurone system of the locust, *Locusta migratoria*. 3. Cercal activation of thoracic motor pathways. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 165: 523–537.

48 Boyan, G. S. and E. E. Ball. 1990. Neuronal organization and information processing in the wind-sensitive cercal receptor giant interneuron system of the locust and other orthopteroid insects. *Progress in Neurobiology* 35: 217–243.

49 Bratton, B. O. and J. L. Ayers. 1987. Observations on the electric organ discharge of two skate species (Chondrichthyes, Rajidae) and its relationship to behavior. *Environmental Biology of Fishes* 20: 241–254.

50 Brecht, M., B. Preilowski, and M. M. Merzenich. 1997. Functional architecture of the mystacial vibrissae. *Behavioural Brain Research* 84: 81–97.

51 Breihaupt, T. and J. Tautz. 1990. The sensitivity of crayfish mechanoreceptors to hydrodynamic and acoustic stimuli. In *Frontiers in Crustacean Neurobiology* (K. Wiese, W. D. Krenz, J. Tautz, and R. H. Mulloney, eds.), pp. 114–120. Basel: Birkhäuser.

52 Briceno, R. D. and W. G. Eberhard. 2002. Courtship in the medfly, *Ceratitis capitata*, includes tactile stimulation with the male's aristae. *Entomologia Experimentalis Et Applicata* 102: 221–228.

53 Brick, O. 1998. Fighting behaviour, vigilance and predation risk in the cichlid fish *Nannacara anomala*. *Animal Behaviour* 56: 309–317.

54 Brick, O. and S. Jakobsson. 2002. Individual variation in risk taking: the effect of a predatory threat on fighting behavior in *Nannacara anomala*. *Behavioral Ecology* 13: 439–442.

55 Brooke, M. D. 1985. The effect of allopreening on tick burdens of molting Eudyptid penguins. *Auk* 102: 893–895.

56 Brown, B. R., M. E. Hughes, and C. Russo. 2005. Infrastructure in the electric sense: admittance data from shark hydrogels. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 191: 115–123.

57 Brusca, R. C. and G. J. Brusca. 2003. *Invertebrates, 2nd Edition*. Sunderland, MA: Sinauer Associates.

58 Buchler, E. R., T. B. Wright, and E. D. Brown. 1981. On the functions of stridulation by the passalid beetle *Odontotaenius disjunctus* (Coleoptera, Passalidae). *Animal Behaviour* 29: 483–486.

59 Budelmann, B. U. and H. Bleckmann. 1988. A lateral line analog in cephalopods-water waves generate microphonic potentials in the epidermal head lines of *Sepia* and *Lolliguncula*. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 164: 1–5.

60 Budelmann, B. U. 1989. Hydrodynamic receptor systems in invertebrates. In *The Mechanosensory Lateral Line: Neurobiology and Evolution* (P. Görner and H. Münz, eds.), pp. 607–631. New York: Springer.

61 Budelmann, B. U. 1992. Hearing in Crustacea. In *Evolutionary Biology of Hearing* (D. B. Webster, R. R. Fay, and A. N. Popper, eds.), pp. 131–139. Heidelberg: Springer-Verlag.

62 Budelmann, B. U. 1994. Cephalopod sense organs, nerves and the brain: Adaptations for high performance and life style. *Marine and Freshwater Behaviour and Physiology* 25: 13–33.

63 Budelmann, B. U. 1994. Directional sensitivity of hair cell afferents in the *Octopus* statocyst. *Journal of Experimental Biology* 187: 245–259.

64 Budelmann, B. U. 1996. Active marine predators: The sensory world of cephalopods. *Marine and Freshwater Behaviour and Physiology* 27: 59–75.

65 Bullock, T. H., D. A. Bodznick, and R. G. Northcutt. 1983. The phylogenetic distribution of electroreception - evidence for convergent evolution of a primitive vertebrate sense modality. *Brain Research Reviews* 6: 25–46.

66 Burighel, P., N. J. Lane, G. Fabio, T. Stefano, G. Zaniolo, M. Daniela, C. Carnevali, and L. Manni. 2003. Novel, secondary sensory cell organ in ascidians: In search of the ancestor of the vertebrate lateral line. *Journal of Comparative Neurology* 461: 236–249.

67 Camhi, J. M. and W. Tom. 1978. The escape behavior of the cockroach *Periplaneta americana*. I. Turning response to wind puffs. *Journal of Comparative Physiology* 128: 193–201.

68 Caputi, A. A., B. Carlson, and O. Macadar. 2005. Electric organs and their control. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 410–451. New York, NY: Springer Science+Business Media.

69 Caputi, A. A. and R. Budelli. 2006. Peripheral electrosensory imaging by weakly electric fish. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 192: 587–600.

70 Carlson, B. 2006. A neuroethology of electrocommunication: senders, receivers, and everything in between. In *Communication in Fishes, Vol. 2* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 805–848. Enfield, NJ: Science Publishers.

71 Carlson, B. A. and C. D. Hopkins. 2004. Stereotyped temporal patterns in electrical communication. *Animal Behaviour* 68: 867–878.

72 Castano, P., C. Rumio, M. Morini, A. Miani, and S. M. Castano. 1995. 3-dimensional reconstruction of the Meissner corpuscle of man, after silver impregnation and immunofluorescence with PGP-9.5 antibodies using confocal scanning laser microscopy. *Journal of Anatomy* 186: 261–270.

73 Catania, K. C. 2000. Epidermal sensory organs of moles, shrew-moles, and desmans: A study of the family talpidae with comments on the function and evolution of Eimer's organ. *Brain Behavior and Evolution* 56: 146–174.

74 Catania, K. C. 2002. Barrels, stripes, and fingerprints in the brain - Implications for theories of cortical organization. *Journal of Neurocytology* 31: 347–358.

75 Catania, K. C. and E. C. Henry. 2006. Touching on somatosensory specializations in mammals. *Current Opinion in Neurobiology* 16: 467–473.

76 Cernuda-Cernuda, R. and J. M. Garcia-Fernandez. 1996. Structural diversity of the ordinary and specialized lateral line organs. *Microscopy Research and Technique* 34: 302–312.

77 Christensen, S. T., L. B. Pedersen, L. Schneider, and P. Satir. 2007. Sensory cilia and integration of signal transduction in human health and disease. *Traffic* 8: 97–109.

78 Cocroft, R. B. 2001. Vibrational communication and the ecology of group-living, herbivorous insects. *American Zoologist* 41: 1215–1221.

79 Cold, C. J. and K. A. McGrath. 1999. Anatomy and histology of the penile and clitoral prepuce in primates: evolutionary perspective of specialized tissue of the external genitalia. In *Male and Female Circumcision: Medical, Legal, and Ethical Considerations in Pediatric Practice* (G. C. Denniston, F. M. Hodges, and M. F. Milos, eds.), pp. 19–30. New York: Kluwer Academic/Plenum Publishers.

80 Cold, C. J. and J. R. Taylor. 1999. The prepuce. *British Journal of Urology* 83(Suppl 1): 34–44.

81 Collin, S. P. and D. Whitehead. 2004. The functional roles of passive electroreception in non-electric fishes. *Animal Biology* 54: 1–25.

82 Connor, R. C., R. S. Wells, J. Mann, and A. J. Read. 2000. The bottlenose dolphin: social relationships in a fission-fusion society. In *Cetacean Societies: Field Studies of Dolphins and Whales* (J. Mann, R. C. Connor, P. L. Tyack, and H. Whitehead, eds.), pp. 91–126. Chicago, IL: University of Chicago Press.

83 Coombs, S., J. Janssen, and J. F. Webb. 1988. Diversity of lateral line systems: evolutionary and functional considerations. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 553–593. New York: Springer-Verlag.

84 Coombs, S., P. Görner, and H. Münz, eds. 1989. *The Mechanosensory Lateral Line: Neurobiology and Evolution*. Vol. Springer-Verlag: New York.

85 Coombs, S. and J. C. Montgomery. 1999. The enigmatic lateral line system. In *Comparative Hearing: Fish and Amphibians* (R. R. Fay and A. N. Popper, eds.), pp. 319–362. New York: Springer-Verlag.

86 Coombs, S. 2001. Smart skins: Information processing by lateral line flow sensors. *Autonomous Robots* 11: 255–261.

87 Coombs, S. and J. C. Montgomery. 2005. Comparing octavolateralis sensory systems: what can we learn? In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 318–359. New York, NY: Springer Science+Business Media.

88 Costa, J. T. 1997. Caterpillars as social insects. *American Scientist* 85: 150–159.

89 Costa, J. T. and R. W. Louque. 2001. Group foraging and trail following behavior of the red-headed pine sawfly *Neodiprion lecontei* (Fitch) (Hymenoptera : Symphyta : Diprionidae). *Annals of the Entomological Society of America* 94: 480–489.

90 Costa, J. T., D. A. Gotzek, and D. H. Janzen. 2003. Late instar shift in foraging strategy and trail pheromone use by caterpillars of the Neotropical moth *Arsenura armida* (Cramer) (Saturniidae: Arsenurinae). *Journal of the Lepidopterists' Society* 57: 220–229.

91 Costa, J. T., T. D. Fitzgerald, A. Pescador-Rubio, J. Mays, and D. H. Janzen. 2004. Social behavior of larvae of the Neotropical processionary weevil *Phelypera distigma* (Boheman) (Coleoptera : Curculionidae : Hyperinae). *Ethology* 110: 515–530.

92 Crampton, W. G. R. and J. S. Albert. 2006. Evolution of electric signal diversity in gymnotiform fishes. In *Communication in Fishes, Vol. 2* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 647–731. Enfield, NJ: Science Publishers.

93 Crawford, J. D. 1991. Sex recognition by electric cues in a sound-producing mormyrid fish, *Pollimyrus isidori*. *Brain Behavior and Evolution* 38: 20–38.

94 Crawford, J. D. 1992. Individual and sex specificity in the electric organ discharges of breeding mormyrid fish (*Pollimyrus isidori*). *Journal of Experimental Biology* 164: 79–102.

95 Crawford, J. D. 1997. Hearing and acoustic communication in mormyrid electric fishes. *Marine and Freshwater Behaviour and Physiology* 29: 65–86.

96 Crawford, J. D. and X. Huang. 1999. Communication signals and sound production mechanisms of mormyrid electric fish. *Journal of Experimental Biology* 202: 1417–1426.

97 Crish, S. D., F. L. Rice, T. J. Park, and C. M. Comer. 2003. Somatosensory organization and behavior in naked mole-rats I: Vibrissa-like body hairs comprise a sensory array that mediates orientation to tactile stimuli. *Brain Behavior and Evolution* 62: 141–151.

98 Crouau, Y. 2001. Mechanosensitive cells of hexapods, crustaceans and myriapods setae: A comparison under phylogenetic aspects. *Annales De La Societe Entomologique De France* 37: 233–242.

99 De Perera, T. B. 2004. Spatial parameters encoded in the spatial map of the blind Mexican cave fish, *Astyanax fasciatus*. *Animal Behaviour* 68: 291–295.

100 Dehnhardt, G., B. Mauck, and H. Bleckmann. 1998. Seal whiskers detect water movements. *Nature* 394: 235–236.

101 Dehnhardt, G., H. Hyvarinen, A. Palviainen, and G. Klauer. 1999. Structure and innervation of the vibrissal follicle-sinus complex in the Australian water rat, *Hydromys chrysogaster*. *Journal of Comparative Neurology* 411: 550–562.

102 Dehnhardt, G., B. Mauck, W. Hanke, and H. Bleckmann. 2001. Hydrodynamic trail-following in harbor seals (*Phoca vitulina*). *Science* 293: 102–104.

103 Delfino, G., R. Brizzi, and C. Calloni. 1984. Lateral line organs in *Salamandrina terdigitata* (Lacepede, 1788) (Amphiiba, Urodela). *Zeitschrift Fur Mikroskopisch-Anatomische Forschung* 98: 161–183.

104 Delmas, P. 2005. Polycystins: polymodal receptor/ion-channel cellular sensors. *Pflugers Archiv-European Journal of Physiology* 451: 264–276.

105 Denton, E. J. and J. Gray. 1985. Lateral line-like antennae of certain of the Penaeidea (Crustacea, Decapoda, Natantia). *Proceedings of the Royal Society of London Series B-Biological Sciences* 226: 249–261.

106 Denton, E. J. and J. A. B. Gray. 1988. Mechanical factors in the excitation of the lateral lines of fishes. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 595–617. New York: Springer-Verlag.

107 Dixson, A. F. and M. J. Anderson. 2004. Sexual behavior, reproductive physiology and sperm competition in male mammals. *Physiology and Behavior* 83: 361–371.

108 Doall, M. H., J. R. Strickler, D. M. Fields, and J. Yen. 2002. Mapping the free-swimming attack volume of a planktonic copepod, *Euchaeta rimana*. *Marine Biology* 140: 871–879.

109 Douglass, J. K. and L. A. Wilkens. 1998. Directional selectivities of near-field filiform hair mechanoreceptors on the crayfish tailfan (Crustacea : Decapoda). *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 183: 23–34.

110 Dunbar, R. I. M. 1991. Functional significance of social grooming in primates. *Folia Primatologica* 57: 121–131.

111 Dunlap, K. D. and J. Larkins-Ford. 2003. Diversity in the structure of electrocommunication signals within a genus of electric fish, Apteronotus. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 189: 153–161.

112 Eberhard, W. G. 1985. *Sexual Selection and Animal Genitalia*. Cambridge, MA: Harvard University Press.

113 Eckert, R. and Y. Naitoh. 1972. Bioelectric control of locomotion in the ciliates. *Journal of Eukaryotic Microbiology* 19: 237–243.

114 Eckert, R. and P. Brehm. 1979. Ionic mechanisms of excitation in *Paramecium*. *Annual Review of Biophysics and Bioengineering* 8: 353–383.

115 Edwards, J. S. and G. R. Reddy. 1986. Mechanosensory appendages and giant interneurons in the firebrat (*Thermobia domestica*, Thysanura): a prototype system for terrestrial predator evasion. *Journal of Comparative Neurology* 243: 535–546.

116 Eeuwes, L. B. M., R. C. Peters, F. Bretschneider, and W. J. G. Loos. 2001. Electroreception of catfish *Ictalurus nebulosus* in uniform and non-uniform DC fields: detection threshold and body length. *Belgian Journal of Zoology* 131(Suppl 2): 73–78.

117 Engelmann, J., W. Hanke, J. Mogdans, and H. Bleckmann. 2000. Neurobiology - Hydrodynamic stimuli and the fish lateral line. *Nature* 408: 51–52.

118 Engelmann, J., J. Mogdans, and H. Bleckmann. 2000. The influence of hydrodynamic noise on the response of the peripheral lateral line system of the goldfish, *Carassius auratus*, to vibrating sphere stimuli. *European Journal of Neuroscience* 12: 493–493.

119 Engelmann, J., W. Hanke, and H. Bleckmann. 2002. Lateral line reception in still- and running water. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 188: 513–526.

120 Estes, R. D. 1991. *The Behavior Guide to African Mammals*. Berkeley, CA: University of California Press.

121 Evrard, H. C. and J. Balthazart. 2002. The assessment of nociceptive and non-nociceptive skin sensitivity in the Japanese quail (*Coturnix japonica*). *Journal of Neuroscience Methods* 116: 135–146.

122 Ewer, R. F. 1968. *Ethology of Mammals*. New York: Plenum Press.

123 Fagan, B. M. and P. M. B. Cahusac. 2001. Evidence for glutamate receptor mediated transmission at mechanoreceptors in the skin. *Neuroreport* 12: 341–347.

124 Feigenbaum, D. and M. R. Reeve. 1977. Prey detection in Chaetognatha - response to a vibrating probe and experimental determination of attack distance in large aquaria. *Limnology and Oceanography* 22: 1052–1058.

125 Feigenbaum, D. L. 1978. Hair fan patterns in Chaetognatha. *Canadian Journal of Zoology-Revue Canadienne De Zoologie* 56: 536–546.

126 Feigenbaum, D. L. and R. C. Maris. 1984. Feeding in the Chaetognatha. *Oceanography and Marine Biology* 22: 343–392.

127 Fernandes, M. C., E. P. Alvares, P. Gama, and M. Silveira. 2001. The sensory border of the land planarian *Bipalium kewense* (Tricladida, Terricola). *Belgian Journal of Zoology* 131: 173–178.

128 Fitzgerald, T. D. 2001. Nightlife of social caterpillars. *Natural History* 110: 38–42.

129 Fitzgerald, T. D. and A. Pescador-Rubio. 2002. The role of tactile and chemical stimuli in the formation and maintenance of the processions of the social caterpillar *Hylesia lineata* (Lepidoptera : Saturniidae). *Journal of Insect Behavior* 15: 659–674.

130 Fitzgerald, T. D. 2003. Role of trail pheromone in foraging and processionary behavior of pine processionary caterpillars Thaumetopoea pityocampa. *Journal of Chemical Ecology* 29: 513–532.

131 Fitzgerald, T. D., A. Pescador-Rubio, M. T. Turna, and J. T. Costa. 2004. Trail marking and processionary behavior of the larvae of the weevil *Phelypera distigma* (Coleoptera : Curculionidae). *Journal of Insect Behavior* 17: 627–646.

132 Flammang, P., C. Deridder, and M. Jangoux. 1991. Ultrastructure of the penicillate podia of the spatangoid echinoid *Echinocardium cordatum* (Echinodermata) with special emphasis on the epidermal sensory secretory complexes. *Acta Zoologica* 72: 151–158.

133 Flowers, R. W. and J. T. Costa. 2003. Larval communication and group foraging dynamics in the red-headed sawfly, *Neodiprion lecontei* (Fitch) (Hymenoptera: Symphyta: Diprionidae). *Annals of the Entomological Society of America* 96: 336–343.

134 Forsman, E. D. and H. M. Wight. 1979. Allopreening in owls- what are its functions. *Auk* 96: 525–531.

135 Fox, G. Q., G. P. Richardson, and C. Kirk. 1985. *Torpedo* electromotor system development, neuronal cell death, and electric organ development in the 4th branchial arch. *Journal of Comparative Neurology* 236: 274–281.

136 Fox, H. 1999. Barbels and barbel-like tentacular structures in sub-mammalian vertebrates: a review. *Hydrobiologia* 403: 153–193.

137 Franosch, J. M. P., H. J. A. Hagedorn, J. Goulet, J. Engelmann, and J. L. van Hemmen. 2009. Wake tracking and the detection of vortex rings by the canal lateral line of fish. *Physical Review Letters* 103:

138 Garber, P. A. and J. A. Rehg. 1999. The ecological role of the prehensile tail in white-faced capuchins (*Cebus capucinus*). *American Journal of Physical Anthropology* 110: 325–339.

139 Gentle, M. J. and J. Breward. 1986. The bill tip organ of the chicken (*Gallus gallus* var *domesticus*). *Journal of Anatomy* 145: 79–85.

140 Gibbs, M. A. 2004. Lateral line receptors: Where do they come from developmentally and where is our research going? *Brain Behavior and Evolution* 64: 163–181.

141 Gibbs, M. A. and R. G. Northcutt. 2004. Development of the lateral line system in the shovelnose sturgeon. *Brain Behavior and Evolution* 64: 70–84.

142 Gillespie, P. G. and R. G. Walker. 2001. Molecular basis of mechanosensory transduction. *Nature* 413: 194–202.

143 Gompel, N., C. Dambly-Chaudiere, and A. Ghysen. 2001. Neuronal differences prefigure somatotopy in the zebrafish lateral line. *Development* 128: 387–393.

144 Gottschaldt. 1985. Structure and function of avian somatosensory receptors. In *Form and Function in Birds, Vol. 3* (A. S. King and J. McLelland, eds.), pp. 375–461. New York: Academic Press.

145 Gould, E., W. McShea, and T. Grand. 1993. Function of the star in the star-nosed mole, *Condylura cristata*. *Journal of Mammalogy* 74: 108–116.

146 Graff, C. and B. Kramer. 1992. Trained weakly-electric fishes *Pollimyrus isidori* and *Gnathonemus petersii* (Mormyridae, Teleostei) discriminate between waveforms of electric pulse discharges. *Ethology* 90: 279–292.

147 Gray, J. A. B. and E. J. Denton. 1991. Fast pressure pulses and communication between fish. *Journal of the Marine Biological Association of the United Kingdom* 71: 83–106.

148 Grégoire, J.-C. 1988. Larval gregariousness in the Chrysomelidae. In *Biology of the Chrysomelidae* (P. Jolivet, E. Petitpierre, and T. H. Hsio, eds.), pp. 253–260. Boston, MA: Kluwer Academic Publishers.

149 Gregory, J. E., A. Iggo, A. K. McIntyre, and U. Proske. 1989. Responses of electroreceptors in the snout of the echidna. *Journal of Physiology-London* 414: 521–538.

150 Gregory, P. T. 1982. Reptilian hibernation. In *Biology of the Reptilia. Vol. 13. Physiology D* (C. Gans and F. H. Pough, eds.), pp. 53–154. London, UK: Academic Press.

151 Grim, M. and Z. Halata. 2000. Developmental origin of avian Merkel cells. *Anatomy and Embryology* 202: 401–410.

152 Guclu, B., E. A. Schepis, S. Yelke, C. A. Yucesoy, and S. J. Bolanowski. 2006. Ovoid geometry of the Pacinian corpuscle is not the determining factor for mechanical excitation. *Somatosensory and Motor Research* 23: 119–126.

153 Hagedorn, M. and W. Heiligenberg. 1985. Court and spark: electric signals in the courtship and mating of gymnotid fish. *Animal Behavior* 33: 254–265.

154 Hagedorn, M. 1986. The ecology, courtship, and mating of gymnotiform electric fish. In *Electroreception* (T. W. Bullock and W. Heiligenberg, eds.), pp. 497–525. New York: Wiley and Sons.

155 Hagedorn, M. and R. Zelick. 1989. Relative dominance among males is expressed in the electric organ discharge characteristics of a weakly electric fish. *Animal Behavior* 38: 520–525.

156 Hagedorn, M., M. Womble, and T. E. Finger. 1990. Synodontid catfish-a new group of weakly electric fish. *Brain Behavior and Evolution* 35: 268–277.

157 Haine, O. S., P. V. Ridd, and R. J. Rowe. 2001. Range of electrosensory detection of prey by *Carcharhinus melanopterus* and *Himantura granulata*. *Marine and Freshwater Research* 52: 291–296.

158 Halata, Z. and B. L. Munger. 1981. The ultrastructure of Ruffini corpuscles of hairy skin in man and rhesus monkey. *Journal of Cutaneous Pathology* 8: 172–173.

159 Halata, Z. and B. L. Munger. 1986. The neuroanatomical basis for the protopathic sensibility of the human glans penis. *Brain Research* 23: 205–230.

160 Halata, Z., W. Schulze, and K. H. Hohne. 1986. The ultrastructure and computer-aided dimensional aspect of Ruffini corpuscles in human skin of the prepuce and pig skin of the nose. *Anatomical Record* 214: A48–A48.

161 Halata, Z. 1993. Sensory innervation of the hairy skin (light microscopic and electron microscopic study). *Journal of Investigative Dermatology* 101: S75–S81.

162 Halata, Z. and M. Grim. 1993. Sensory nerve endings in the beak skin of Japanese quail *Anatomy and Embryology* 187: 131–138.

163 Halata, Z., M. Grim, and K. I. Bauman. 2003. Friedrich Sigmund Merkel and his "Merkel cell", morphology, development, and physiology: Review and new results. *Anatomical Record Part A-Discoveries in Molecular Cellular and Evolutionary Biology* 271A: 225–239.

164 Hama, K. and Y. Uehara. 1964. The fine structure of the frog muscle spindles. *Journal of Electron Microscopy* 13: 34–34.

165 Hanika, S. and B. Kramer. 2000. Electrosensory prey detection in the African sharptooth catfish, *Clarias gariepinus* (Clariidae), of a weakly electric mormyrid fish, the bulldog (*Marcusenius macrolepidotus*). *Behavioral Ecology and Sociobiology* 48: 218–228.

166 Hanika, S. and B. Kramer. 2005. Intra-male variability of its communication signal in the weakly electric fish, *Marcusenius macrolepidotus* (South African form), and possible functions. *Behaviour* 142: 145–166.

167 Hanke, W., C. Brucker, and H. Bleckmann. 2000. The ageing of the low-frequency water disturbances caused by swimming goldfish and its possible relevance to prey detection. *Journal of Experimental Biology* 203: 1193–1200.

168 Hanke, W. and H. Bleckmann. 2004. The hydrodynamic trails of *Lepomis gibbosus* (Centrarchidae), *Colomesus psittacus* (Tetraodontidae) and *Thysochromis ansorgii* (Cichlidae) investigated with scanning particle image velocimetry. *Journal of Experimental Biology* 207: 1585–1596.

169 Harrison, C. J. O. 1965. Allopreening as agonistic behaviour. *Behaviour* 24: 161–209.

170 Harrison, C. J. O. 1969. Further records of allopreening. *Avicultural Magazine* 75: 97–99.

171 Hartmann, M. J., N. J. Johnson, R. B. Towal, and C. Assad. 2003. Mechanical characteristics of rat vibrissae: Resonant frequencies and damping in isolated whiskers and in the awake behaving animal. *Journal of Neuroscience* 23: 6510–6519.

172 Hassan, E. S. 1986. On the discrimination of spatial intervals by the blind cave fish (*Anoptichthys jordani*). *Journal of Comparative Physiology* 159: 701–710.

173 Heiligenberg, W. 1975. Theoretical and experimental approaches to spatial aspects of electrolocation. *Journal of Comparative Physiology* 103: 247–272.

174 Heiligenberg, W. 1977. *Principles of Electrolocation and Jamming Avoidance in Electric Fish*. Berlin: Springer-Verlag.

175 Heinzel, H. G. and M. Dambach. 1987. Travelling air vortex rings as potential communication signals in a cricket. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 160: 79–88.

176 Hill, K., R. Hemmler, P. Kovermann, M. Calenberg, G. Kreimer, and R. Wagner. 2000. A Ca2+- and voltage-modulated flagellar ion channel is a component of the mechanoshock response in the unicellular green alga *Spermatozopsis similis*. *Biochimica Et Biophysica Acta-Biomembranes* 1466: 187–204.

177 Himstedt, W., J. Kopp, and W. Schmidt. 1982. Electroreception guides feeding behavior in amphibians. *Naturwissenschaften* 69: 552–553.

178 Hoffmann, J. N., A. G. Montag, and N. J. Dominy. 2004. Meissner corpuscles and somatosensory acuity: The prehensile appendages of primates and elephants. *Anatomical Record Part A-Discoveries in Molecular Cellular and Evolutionary Biology* 281A: 1138–1147.

179 Hõlldobler, B. and E. O. Wilson. 1990. *The Ants*. Cambridge, MA: Belknap Press.

180 Holtmann, M. and U. Thurm. 2001. Mono- and oligo-vesicular synapses and their connectivity in a Cnidarian sensory epithelium (*Coryne tubulosa*). *Journal of Comparative Neurology* 432: 537–549.

181 Hopkins, C. D. 1973. Lightning as background noise for communication among electric fish. *Nature* 242: 268–270.

182 Hopkins, C. D. 1974. Electric communication in the reproductive behavior of *Sternopygus macrurus* (Gymnotoidei). *Zeitschrift für Tierpsychologie* 35: 518–535.

183 Hopkins, C. D. 1974. Electric communication: functions in the social behavior of *Eigenmannia virescens*. *Behaviour* 50: 270–305.

184 Hopkins, C. D. 1976. Stimulus filtering and electroreception: tuberous electroreceptors in three species of gymnotid fish. *Journal of Comparative Physiology* 111: 171–207.

185 Hopkins, C. D. 1977. Electric communication. In *How Animals Communicate* (T. A. Sebeok, ed.), pp. 263–289. Bloomington, IN: Indiana University Press.

186 Hopkins, C. D. and W. Heiligenberg. 1978. Evolutionary designs for electric signals and electroreceptors in gymnotid fishes of Surinam. *Behavioral Ecology and Sociobiology* 3: 113–134.

187 Hopkins, C. D. and A. H. Bass. 1981. Temporal coding of species recognition signals in electric fish. *Science* 212: 85–87.

188 Hopkins, C. D. 1986. Behavior of Mormyridae. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 527–576. New York: John Wiley and Sons.

189 Hopkins, C. D. 1988. Social communication in the aquatic environment. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 233–268. New York: Springer-Verlag.

190 Hopkins, C. D. 1995. Convergent designs for electrogenesis and electroreception. *Current Opinion in Neurobiology* 5: 769–777.

191 Hopkins, C. D. 1999. Design features for electric communication. *Journal of Experimental Biology* 202: 1217–1228.

192 Hopkins, C. D. 2005. Passive electrolocation and the sensory guidance of oriented behavior. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 264–289. New York, NY: Springer Science+Business Media.

193 Horridge, G. A. and P. S. Boulton. 1967. Prey detection by Chaetognatha via a vibration sense. *Proceedings of the Royal Society of London Series B-Biological Sciences* 168: 413–419.

194 Hosken, D. J. and P. Stockley. 2004. Sexual selection and genital evolution. *Trends in Ecology and Evolution* 19: 87–93.

195 Humphrey, J. A. C., F. G. Barth, M. Reed, and A. Spak. 2003. The physics of arthropod medium-flow sensitive hairs: biological models for artificial sensors. In *Sensors and Sensing in Biology and Engineering* (F. G. Barth, J. A. C. Humphrey, and T. Secomb, eds.), pp. 129–144. Berlin, Germany: Springer.

196 Ide, C. 1977. Development of Meissner corpuscle of mouse toe pad. *Anatomical Record* 188: 49–67.

197 Iwatsuki, K. and T. Hirano. 1996. An increase in the influx of calcium ions into cilia induces thigmotaxis in *Paramecium caudatum*. *Experientia* 52: 831–833.

198 Jacob, B. A., J. D. McEachran, and P. L. Lyons. 1994. Electric organs in skates-variation and phylogenetic significance (Chondrichthyes, Rajoidei). *Journal of Morphology* 221: 45–63.

199 Jacobs, G. 1995. Detection and analysis of air currents by crickets. *Bioscience* 45: 776–785.

200 Jacobs, G. A. and F. E. Theunissen. 1996. Functional organization of a neural map in the cricket cercal sensory system. *Journal of Neuroscience* 16: 769–784.

201 Jacobs, G. A. and F. E. Theunissen. 2000. Extraction of sensory parameters from a neural map by primary sensory interneurons. *Journal of Neuroscience* 20: 2934–2943.

202 Jain, N., K. C. Catania, and J. H. Kaas. 1998. A histologically visible representation of the fingers and palm in primate area 3b and its immutability following long-term deafferentations. *Cerebral Cortex* 8: 227–236.

203 Jain, N., H. X. Qi, K. C. Catania, and J. H. Kaas. 2001. Anatomic correlates of the face and oral cavity representations in the somatosensory cortical area 3b of monkeys. *Journal of Comparative Neurology* 429: 455–468.

204 Janssen, J. 2004. Lateral line sensory ecology. In *The Senses of Fish: Adaptations for the Reception of Natural Stimuli* (G. von der Emde, J. Mogdans, and B. G. Kapoor, eds.), pp. 231–264. Boston, MA: Kluwer Academic Publishers.

205 Janssen, J. and J. R. Strickler. 2006. Hydromechanical communication via the lateral line: copepodology for the ichthyologist. In *Communication in Fishes, Vol. 1* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 207–222. Enfield, NH: Science Publishers.

206 Jaroensutasinee, M. and K. Jaroensutasinee. 2003. Type of intruder and reproductive phase influence male territorial defence in wild-caught Siamese fighting fish. *Behavioural Processes* 64: 23–29.

207 Johnson, K. O., T. Yoshioka, and F. Vega-Bermudez. 2000. Tactile functions of mechanoreceptive afferents innervating the hand. *Journal of Clinical Neurophysiology* 17: 539–558.

208 Johnson, K. O. 2001. The roles and functions of cutaneous mechanoreceptors. *Current Opinion in Neurobiology* 11: 455–461.

209 Johnson, R. D. and Z. Halata. 1991. Topography and ultrastructure of sensory nerve endings in the glans penis of the rat. *Journal of Comparative Neurology* 312: 299–310.

210 Jolivet, P., J. Vasconcellos-Neto, and P. Weinstein. 1990. Cycloalexy: a new concept in the larval defence of insects. *Insecta Mundi* 4: 133–142.

211 Jolivet, P. and J.-M. Maes. 1996. Un cas de cycloalexie chez un Curculionidae: *Phelypera distigma* (Boheman) (Hyperinae) au Nicaragua. *L' Entomologiste* 52: 97–100.

212 Jørgensen, J. M. 2005. Morphology of electroreceptive sensory organs. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 47–67. New York, NY: Springer Science+Business Media.

213 Kajiura, S. M. and K. N. Holland. 2002. Electroreception in juvenile scalloped hammerhead and sandbar sharks. *Journal of Experimental Biology* 205: 3609–3621.

214 Kajiura, S. M. 2003. Electroreception in neonatal bonnethead sharks, *Sphyrna tiburo*. *Marine Biology* 143: 603–611.

215 Kalmijn, A. J. 1974. The detection of electric fields from inanimate and animate sources other than electric organs. In *Handbook of Sensory Physiology* (A. Fessard, ed.), pp. 148–200. Berlin: Springer-Verlag.

216 Kalmijn, A. J. 1988. Detection of weak electric fields. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 151–186. New York: Springer-Verlag.

217 Kalmijn, A. J. 1988. Hydrodynamic and acoustic field detection. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 83–130. New York: Springer-Verlag.

218 Kämper, G. and M. Dambach. 1979. Communication by infrasound in a non-stridulating cricket. *Naturwissenschaften* 66: 530.

219 Katoh, K. and Y. Naitoh. 1992. A mechanosensory mechanism for evoking cellular contraction in *Vorticella*. *Journal of Experimental Biology* 168: 253–267.

220 Katoh, K. and M. Kikuyama. 1997. An all-or-nothing rise in cytosolic [Ca2+] in *Vorticella sp*. *Journal of Experimental Biology* 200: 35–40.

221 Katz, B. 1961. Terminations of afferent nerve fibre in muscle spindle of frog. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 243: 221–240.

222 Katzir, G. 1983. Bowing and allopreening of captive jackdaws *Corvus monedula*. *Ibis* 125: 516–523.

223 Kawasaki, M. 2005. Physiology of tuberous electrosensory systems. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 154–194. New York, NY: Springer Science+Business Media.

224 Keil, T. A. 1997. Functional morphology of insect mechanoreceptors. *Microscopy Research and Technique* 39: 506–531.

225 Keller, C. H. 2004. Electroreception: strategies for separation of signals from noise. In *The Senses of Fish: Adaptations for the Reception of Natural Stimuli* (G. von der Emde, J. Mogdans, and B. G. Kapoor, eds.), pp. 330–361. Boston, MA: Kluwer Academic Publishers.

226 Kerem, G., M. Yoshimoto, N. Yamamoto, C. Y. Yang, H. G. Xue, and H. Ito. 2005. Somatotopic organization of the trigeminal ganglion cells in a cichlid fish, *Oreochromis (Tilapia) niloticus*. *Brain Behavior and Evolution* 65: 109–126.

227 Kernan, M. and C. Zuker. 1995. Genetic approaches to mechanosensory transduction. *Current Opinion in Neurobiology* 5: 443–448.

228 Kim, N., N. Fujitsuka, and F. Ito. 1985. Ultrastructural changes of the sensory nerve terminals in frog muscle spindle during dynamic stretch. *Journal of Neurocytology* 14: 105–112.

229 Kirkpatrick, T. W. 1957. *Insect Life in the Tropics*. London, UK: Longmans, Green, and Company, Ltd.

230 Kirschbaum, F. 1983. Myogenic electric organ precedes the neurogenic organ in apteronotid fish. *Naturwissenschaften* 4: 205–207.

231 Kirschbaum, F. 1995. Reproduction and development in mormyriform and gymnotiform fishes. In *Electric Fishes*: *History and Behavior* (P. Moller, ed.), pp. 267–301. London, UK: Chapman and Hall.

232 Klauer, G., H. Burda, and E. Nevo. 1997. Adaptive differentiations of the skin of the head in a subterranean rodent, *Spalax ehrenbergi*. *Journal of Morphology* 233: 53–66.

233 Kober, K. and A. J. Gaston. 2003. Social interactions among breeding Brunnich's Guillemots *Uria lomvia* suggest constraints in relation to offspring vulnerability. *Ibis* 145: 413–418.

234 Koester, D. M. 2003. Anatomy and motor pathways of the electric organ of skates. *Anatomical Record Part A-Discoveries in Molecular Cellular and Evolutionary Biology* 273A: 648–662.

235 Kolodziejski, J. A., S. E. Sanford, and G. T. Smith. 2007. Stimulus frequency differentially affects chirping in two species of weakly electric fish: implications for the evolution of signal structure and function. *Journal of Experimental Biology* 210: 2501–2509.

236 Komak, S., J. G. Boal, L. Dickel, and B. U. Budelmann. 2005. Behavioural responses of juvenile cuttlefish (*Sepia officinalis*) to local water movements. *Marine and Freshwater Behaviour and Physiology* 38: 117–125.

237 Krainer, K. H. and H. Muller. 1995. Morphology, infraciliature and ecology of a new planktonic ciliate, *Histiobalantium bodamicum* n sp (Scuticociliatida: Histiobalantiidae). *European Journal of Protistology* 31: 389–395.

238 Kramer, B. and B. Kuhn. 1993. Electric signaling and impedance matching in a variable environment: the electric organ of a mormyrid fish actively adapts to changes in water conductivity. *Naturwissenschaften* 80: 43–46.

239 Kramer, B. 1996. *Electroreception and Communication in Fishes*. Stuttgart: Fischer.

240 Kramer, B. 1997. Electric organ discharges and their relation to sex in mormyrid fish. *Naturwissenschaften* 84: 1–4.

241 Krubitzer, L., P. Manger, J. Pettigrew, and M. Calford. 1995. Organization of somatosensory cortex in monotremes-in search of the prototypical plan. *Journal of Comparative Neurology* 351: 261–306.

242 Kruger, L., A. R. Light, and F. E. Schweizer. 2003. Axonal terminals of sensory neurons and their morphological diversity. *Journal of Neurocytology* 32: 205–216.

243 Kung, C. 2005. A possible unifying principle for mechanosensation. *Nature* 436: 647–654.

244 Künz, E. and G. Haszprunar. 2001. Comparative ultrastructure of gastropod cephalic tentacles: Patellogastropoda, Neritaemorphi and Vetigastropoda. *Zoologischer Anzeiger* 240: 137–165.

245 Kutsukake, N. and T. H. Clutton-Brock. 2006. Social functions of allogrooming in cooperatively breeding meerkats. *Animal Behaviour* 72: 1059–1068.

246 Lannoo, M. J. 1987. Neuromast topography in urodele amphibians. *Journal of Morphology* 191: 247–263.

247 Lannoo, M. J. 1987. Neuromast topography in anuran amphibians. *Journal of Morphology* 191: 115–129.

248 Layne, J. N. and D. K. Caldwell. 1964. Behavior of the Amazon dolphin, *Inia geoffrensis* (Blainville), in captivity. *Zoologica* 49: 81–108.

249 Lenz, S., G. Sundermann, and P. Fioroni. 1995. The epidermal lines of *Octopus vulgaris* Lamarck, 1798, and *Sepiola affinis* Naef, 1912 (Mollusca: Cephalopoda) at hatching state. *Zoologischer Anzeiger* 234: 145–157.

250 Ling, J. K. 1977. Vibrissae of marine mammals. In *Functional Anatomy of Marine Mammals, Vol. 3* (J. B. Harrison, ed.), pp. 387–415. London, UK: Academic Press.

251 Lissmann, H. W. and K. E. Machin. 1958. The mechanism of object location in *Gymnarchus niloticus* and similar fish. *Journal of Experimental Biology* 35: 451–486.

252 Lissmann, H. W. 1961. Ecological studies on gymnotids. In *Bioelectrogenesis* (C. Chagas and A. Paes de Carvalho, eds.), pp. 215–226. Amsterdam, Netherlands: Elsevier.

253 Loo, S. K. and Z. Halata. 1991. Innervation of hairs in the facial skin of marsupial mammals. *Journal of Anatomy* 174: 207–219.

254 Lorenzo, D. 2006. Electrocommunication in gymnotiformes: jamming avoidance and social signals during courtship. In *Communication in Fishes, Vol. 2* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 753–779. Enfield, NJ: Science Publishers.

255 Lowe, C. G., R. N. Bray, and D. R. Nelson. 1994. Feeding and associated electrical behavior of the Pacific electric ray *Torpedo californica* in the field. *Marine Biology* 120: 161–169.

256 Lumpkin, E. A. and M. J. Caterina. 2007. Mechanisms of sensory transduction in the skin. *Nature* 445: 858–865.

257 Macdonald, D. M. and D. Schmitt. 1979. Ultrastructure of the human mucocutaneous end organ. *Journal of Investigative Dermatology* 72: 181–186.

258 Macefield, V. G. 2005. Physiological characteristics of low-threshold mechanoreceptors in joints, muscle and skin in human subjects. *Clinical and Experimental Pharmacology and Physiology* 32: 135–144.

259 Machemer, H. and J. W. Deitmer. 1985. Mechanoreception in ciliates. In *Progress in Sensory Physiology, Vol. 5* (D. Ottoson, H. Autrum, E. R. Perl, R. F. Schmidt, H. Schimazu, and W. D. Willis, eds.), pp. 81–118. New York: Springer Verlag.

260 Machemer, H., R. Braucker, S. Machemer-Rohnisch, U. Nagel, D. C. Neugebauer, and M. Weskamp. 1998. The linking of extrinsic stimuli to behaviour: roles of cilia in ciliates. *European Journal of Protistology* 34: 254–261.

261 MacIver, M. A., N. M. Sharabash, and M. E. Nelson. 2001. Prey-capture behavior in gymnotid electric fish: motion analysis and effects of water conductivity. *Journal of Experimental Biology* 204: 543–557.

262 Magal, C., O. Dangles, P. Caparroy, and J. Casas. 2006. Hair canopy of cricket sensory system tuned to predator signals. *Journal of Theoretical Biology* 241: 459–466.

263 Manger, P. R. and J. D. Pettigrew. 1995. Electroreception and the feeding behavior of platypus (*Ornithorhynchus anatinus*, Monotremata, Mammalia). *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 347: 359–381.

264 Manger, P. R., J. D. Pettigrew, J. R. Keast, and A. Bauer. 1995. Nerve terminals of mucous gland electroreceptors in the platypus (*Ornithorhynchus anatinus*). *Proceedings of the Royal Society of London Series B-Biological Sciences* 260: 13–19.

265 Manger, P. R., M. B. Calford, and J. D. Pettigrew. 1996. Properties of electrosensory neurons in the cortex of the platypus (*Ornithorhynchus anatinus*): Implications for processing of electrosensory stimuli. *Proceedings of the Royal Society of London Series B-Biological Sciences* 263: 611–617.

266 Manger, P. R. and J. D. Pettigrew. 1996. Ultrastructure, number, distribution and innervation of electroreceptors and mechanoreceptors in the bill skin of the platypus, *Ornithorhynchus anatinus*. *Brain Behavior and Evolution* 48: 27–54.

267 Manger, P. R., T. M. Woods, and E. G. Jones. 1996. Representation of face and intra-oral structures in area 3b of macaque monkey somatosensory cortex. *Journal of Comparative Neurology* 371: 513–521.

268 Manger, P. R., R. Collins, and J. D. Pettigrew. 1997. Histological observations on presumed electroreceptors and mechanoreceptors in the beak skin of the long-beaked echidna, *Zaglossus bruijnii*. *Proceedings of the Royal Society of London Series B-Biological Sciences* 264: 165–172.

269 Manger, P. R., L. S. Hall, and J. D. Pettigrew. 1998. The development of the external features of the platypus (*Ornithorhynchus anatinus*). *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 353: 1115–1125.

270 Marchesan, M., D. Ota, and E. A. Ferrero. 2000. The role of mechanical stimulation during breeding in the grass goby *Zosterisessor ophiocephalus* (Teleostei, Gobiidae). *Italian Journal of Zoology* 67: 25–30.

271 Markl, H. 1983. Vibrational communication. In *Neuroethology and Behavioral Physiology* (F. Huber and H. Markl, eds.), pp. 332–353. Berlin: Springer.

272 Marshall, C. D., H. Amin, K. M. Kovacs, and C. Lydersen. 2006. Microstructure and innervation of the mystacial vibrissal follicle-sinus complex in bearded seals, *Erignathus barbatus* (Pinnipedia : Phocidae). *Anatomical Record Part A-Discoveries in Molecular Cellular and Evolutionary Biology* 288A: 13–25.

273 Martin, G. R., N. Jarrett, and M. Williams. 2007. Visual fields in Blue Ducks *Hymenolaimus malacorhynchos* and Pink-eared Ducks *Malacorhynchus membranaceus*: visual and tactile foraging. *Ibis* 149: 112–120.

274 Martinac, B. and A. Kloda. 2003. Evolutionary origins of mechanosensitive ion channels. *Progress in Biophysics and Molecular Biology* 82: 11–24.

275 Martinac, B. 2004. Mechanosensitive ion channels: molecules of mechanotransduction. *Journal of Cell Science* 117: 2449–2460.

276 Maruska, K. P. 2001. Morphology of the mechanosensory lateral line system in elasmobranch fishes: Ecological and behavioral considerations. *Environmental Biology of Fishes* 60: 47–75.

277 Masters, W. M. 1979. Insect disturbance stridulation - its defensive role. *Behavioral Ecology and Sociobiology* 5: 187–200.

278 McCormick, C. A. 1982. The organization of the octavolateralis area in actinopterygian fishes: a new interpretation. *Journal of Morphology* 171: 159–181.

279 McGregor, P. K. and G. W. M. Westby. 1992. Discrimination of individually characteristic electric organ discharges by a weakly electric fish. *Animal Behaviour* 43: 977–986.

280 McIver, S. B. 1985. Mechanoreception. In *Comparative Insect Physiology, Biochemistry, and Pharmacology. Vol. 6* (G. A. Kerkut and L. I. Gilbert, eds.), pp. 71–132. Oxford: Pergamon Press.

281 Medina, L. and A. Reiner. 2000. Do birds possess homologues of mammalian primary visual, somatosensory and motor cortices? *Trends in Neurosciences* 23: 1–12.

282 Meyer, J. H. 1982. Behavioral responses of weakly electric fish to complex impedances. *Journal of Comparative Physiology* 145:

283 Mileusnic, M. P. and G. E. Loeb. 2006. Mathematical models of proprioceptors. II. Structure and function of the Golgi tendon organ. *Journal of Neurophysiology* 96: 1789–1802.

284 Mogdans, J., J. Barenbrock, and H. Bleckmann. 2002. Sighted topminnows, *Aplocheilus lineatus*, use the lateral line for surface wave discrimination. *Copeia* 190–194.

285 Moll, I., M. Roessler, J. M. Brandner, A. C. Eispert, P. Houdek, and R. Moll. 2005. Human Merkel cells - aspects of cell biology, distribution and functions. *European Journal of Cell Biology* 84: 259–271.

286 Moller, P., ed. 1995. *Electric Fishes--History and Behavior*. Vol. Chapman and Hall: London, UK.

287 Moller, P. 2006. Electrocommunication: history, insights, and new questions. In *Communication in Fishes, Vol. 2* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 579–598. Enfield, NJ: Science Publishers.

288 Montgomery, J. C. 1984. Noise cancellation in the electrosensory system of the thornback ray - common mode rejection of input produced by the animal's own ventilatory movement. *Journal of Comparative Physiology* 155: 103–111.

289 Montgomery, J. C., S. Coombs, and J. Janssen. 1994. Form and function relationships in lateral line systems: comparative data from six species of antarctic notothenioid fish. *Brain Behavior and Evolution* 44: 299–306.

290 Montgomery, J. C. and D. Bodznick. 1999. Signals and noise in the elasmobranch electrosensory system. *Journal of Experimental Biology* 202: 1349–1355.

291 Montgomery, J. C., F. Macdonald, C. F. Baker, and A. G. Carton. 2002. Hydrodynamic contributions to multimodal guidance of prey capture behavior in fish. *Brain Behavior and Evolution* 59: 190–198.

292 Montgomery, J. C., F. McDonald, C. F. Baker, A. G. Carton, and N. Ling. 2003. Sensory integration in the hydrodynamic world of rainbow trout. *Proceedings of the Royal Society of London Series B-Biological Sciences* 270: S195–S197.

293 Mooring, M. S., D. T. Blumstein, and C. J. Stoner. 2004. The evolution of parasite-defence grooming in ungulates. *Biological Journal of the Linnean Society* 81: 17–37.

294 Moss, A. G., B. Wells, and L. Muellner. 2004. A mechanosensory system that controls feeding in adult Mnemiopsis. *Hydrobiologia* 530–31: 145–153.

295 Mulisch, M. 1991. Ultrastructure and membrane topography of special ciliary organelles in the ciliate *Eufolliculina uhligi* (Protozoa). *Cell and Tissue Research* 265: 145–150.

296 Müller, U. K., J. Smit, E. J. Stamhuis, and J. J. Videler. 2001. How the body contributes to the wake in undulatory fish swimming: Flow fields of a swimming eel (*Anguilla anguilla*). *Journal of Experimental Biology* 204: 2751–2762.

297 Müller, U. K., E. J. Stamhuis, and J. J. Videler. 2002. Riding the waves: the role of the body wave in undulatory fish swimming. *Integrative and Comparative Biology* 42: 981–987.

298 Munger, B. L. and C. Ide. 1988. The structure and function of cutaneous sensory receptors. *Archives of Histology and Cytology* 51: 1–34.

299 Nebel, S., D. L. Jackson, and R. W. Elner. 2005. Functional association of bill morphology and foraging behaviour in calidrid sandpipers. *Animal Biology* 55: 235–243.

300 Nelson, M. E., M. A. MacIver, and S. Coombs. 2002. Modeling electrosensory and mechanosensory images during the predatory behavior of weakly electric fish. *Brain Behavior and Evolution* 59: 199–210.

301 Nelson, M. E. 2005. Target detection, image analysis, and modeling. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 290–317. New York, NY: Springer Science+Business Media.

302 Nelson, M. E. and M. A. MacIver. 2006. Sensory acquisition in active sensing systems. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 192: 573–586.

303 New, J. G. 1994. Electric organ discharge and electrosensory reafference in skates. *Biological Bulletin* 187: 64–75.

304 Newbury, T. K. 1972. Vibration perception by chaetognaths. *Nature* 236: 459–460.

305 Northcutt, R. G. 1980. Anatomical evidence of electroreception in the coelocanth (*Latimeria chalumnae*). *Zentralblatt Fur Veterinarmedizin Reihe C-Journal of Veterinary Medicine Series C-Anatomia Histologia Embryologia* 9: 289–295.

306 Northcutt, R. G. 1986. Electroreception in nonteleost bony fishes. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 257–285. New York: John Wiley and Sons.

307 Northcutt, R. G., K. C. Catania, and B. B. Criley. 1994. Development of lateral line organs in the axolotl. *Journal of Comparative Neurology* 340: 480–514.

308 Northcutt, R. G., K. Brandle, and B. Fritzsch. 1995. Electroreceptors and mechanosensory lateral line organs arise from single placodes in axolotls *Developmental Biology* 168: 358–373.

309 Northcutt, R. G. 1997. Evolution of gnathostome lateral line ontogenies. *Brain Behavior and Evolution* 50: 25–37.

310 Northcutt, R. G. 2005. Ontogeny of electroreceptors and their neural circuitry. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 112–131. New York, NY: Springer Science+Business Media.

311 O'Hagan, R., M. Chalfie, and M. B. Goodman. 2005. The MEC-4 DEG/ENaC channel of *Caenorhabditis elegans* touch receptor neurons transduces mechanical signals. *Nature Neuroscience* 8: 43–50.

312 O'Hagan, R. and M. Chalfie. 2006. Mechanosensation in *Caenorhabditis elegans*. In *Neurobiology of C. Elegans* eds.), pp. 169–203. San Diego: Elsevier Academic Press Inc.

313 Ornithology, C. U. L.o., ed. 2004. *The Birds of North America Online*. Vol. Cornell Lab of Ornithology: Ithaca, NY.

314 Orr, A. W., B. P. Helmke, B. R. Blackman, and M. A. Schwartz. 2006. Mechanisms of mechanotransduction. *Developmental Cell* 10: 11–20.

315 Paintner, S. and B. Kramer. 2003. Electrosensory basis for individual recognition in a weakly electric, mormyrid fish, *Pollimyrus adspersus* (Gunther, 1866). *Behavioral Ecology and Sociobiology* 55: 197–208.

316 Pare, M., A. M. Smith, and F. L. Rice. 2002. Distribution and terminal arborizations of cutaneous mechanoreceptors in the glabrous finger pads of the monkey. *Journal of Comparative Neurology* 445: 347–359.

317 Pare, M., C. Behets, and O. Cornu. 2003. Paucity of presumptive Ruffini corpuscles in the index finger pad of humans. *Journal of Comparative Neurology* 456: 260–266.

318 Pawson, L. and S. J. Bolanowski. 2002. Voltage-gated sodium channels are present on both the neural and capsular structures of Pacinian corpuscles. *Somatosensory and Motor Research* 19: 231–237.

319 Peters, R. C., L. B. M. Eeuwes, and F. Bretschneider. 2007. On the electrodetection threshold of aquatic vertebrates with ampullary or mucous gland electroreceptor organs. *Biological Reviews* 82: 361–373.

320 Pettigrew, J. D., P. R. Manger, and S. L. B. Fine. 1998. The sensory world of the platypus. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 353: 1199–1210.

321 Pettigrew, J. D. 1999. Electroreception in monotremes. *Journal of Experimental Biology* 202: 1447–1454.

322 Pickens, P. E. and W. N. McFarland. 1964. Electric discharge and associated behaviour in stargazer. *Animal Behaviour* 12: 362–367.

323 Plachta, D. T. T., W. Hanke, and H. Bleckmann. 2003. A hydrodynamic topographic map in the midbrain of goldfish *Carassius auratus*. *Journal of Experimental Biology* 206: 3479–3486.

324 Pohlmann, K., F. W. Grasso, and T. Breithaupt. 2001. Tracking wakes: The nocturnal predatory strategy of piscivorous catfish. *Proceedings of the National Academy of Sciences of the United States of America* 98: 7371–7374.

325 Pohlmann, K., J. Atema, and T. Breithaupt. 2004. The importance of the lateral line in nocturnal predation of piscivorous catfish. *Journal of Experimental Biology* 207: 2971–2978.

326 Pohorille, A., K. Schweighofer, and M. A. Wilson. 2005. The origin and early evolution of membrane channels. *Astrobiology* 5: 1–17.

327 Popper, A. N., M. Salmon, and K. W. Horch. 2001. Acoustic detection and communication by decapod crustaceans. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 187: 83–89.

328 Pozis-Francois, O., A. Zahavi, and A. Zahavi. 2004. Social play in Arabian babblers. *Behaviour* 141: 425–450.

329 Praetorius, H. A. and K. R. Spring. 2005. A physiological view of the primary cilium. *Annual Review of Physiology* 67: 515–529.

330 Pritz, M. B. 2002. Midbrain projecting dorsal column nucleus neurons in a reptile. *Brain Research Bulletin* 58: 219–224.

331 Proske, U., J. E. Gregory, and A. Iggo. 1998. Sensory receptors in monotremes. *Philosophical Transactions of the Royal Society of London Series B-Biological Sciences* 353: 1187–1198.

332 Proske, U. and J. E. Gregory. 2004. The role of push rods in platypus and echidna - Some speculations. *Proceedings of the Linnean Society of New South Wales* 125: 319–326.

333 Proske, U. 2006. Kinesthesia: The role of muscle receptors. *Muscle and Nerve* 34: 545–558.

334 Purves, D., G. J. Augustine, D. Fitzpatrick, W. C. Hall, A.-S. LaMantia, J. O. McNamara, and S. M. Williams, eds. 2004. *Neuroscience*. Vol. Sinauer Associates: Sunderland, MA.

335 Radford, A. N. and M. A. Du Plessis. 2006. Dual function of allopreening in the cooperatively breeding green woodhoopoe, *Phoeniculus purpureus*. *Behavioral Ecology and Sociobiology* 61: 221–230.

336 Rankin, C. H. and P. Moller. 1992. Temporal patterning of electric organ discharges in the African electric catfish, *Malapterurus electricus* (Gmelin). *Journal of Fish Biology* 40: 49–58.

337 Reep, R. L., C. D. Marshall, and M. L. Stoll. 2002. Tactile hairs on the postcranial body in Florida manatees: A mammalian lateral line? *Brain Behavior and Evolution* 59: 141–154.

338 Reynolds, P. D. 1992. Distribution and ultrastructure of ciliated sensory receptors in the posterior mantle epithelium of *Dentalium rectius* (Mollusca, Scaphopoda). *Acta Zoologica* 73: 263–270.

339 Reznik, M. 1996. Structure and functions of the cutaneous nervous system. *Pathologie Biologie* 44: 831–837.

340 Ronan, M. 1986. Electroreception in cyclostomes. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 209–224. New York: John Wiley and Sons.

341 Ros, A. F. H., K. Becker, and R. F. Oliveira. 2006. Aggressive behaviour and energy metabolism in a cichlid fish, *Oreochromis mossambicus*. *Physiology and Behavior* 89: 164–170.

342 Rowe, M. J., D. J. Tracey, D. A. Mahns, V. Sahai, and J. J. Ivanusic. 2005. Mechanosensory perception: Are there contributions from bone-associated receptors? *Clinical and Experimental Pharmacology and Physiology* 32: 100–108.

343 Schaefer, S. A. and U. A. Buitrago-Suarez. 2002. Odontode morphology and skin surface features of Andean astroblepid catfishes (Siluriformes, Astroblepidae). *Journal of Morphology* 254: 139–148.

344 Scheffel, A. and B. Kramer. 2006. Intra- and interspecific electrocommunication among sympatric mormyrids in the upper Zambezi River. In *Communication in Fishes, Vol. 2* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 733–751. Enfield, NJ: Science Publishers.

345 Scheich, H., G. Langner, C. Tidemann, R. Coles, and A. Guppy. 1986. Electroreception and electrolocation in platypus. *Nature* 319: 401–402.

346 Schenk, I., A. Spaethe, and Z. Halata. 1996. The structure of sensory nerve endings in the knee joint capsule of the dog. *Annals of Anatomy-Anatomischer Anzeiger* 178: 515–521.

347 Schulte-Pelkum, N., S. Wieskotten, W. Hanke, G. Dehnhardt, and B. Mauck. 2007. Tracking of biogenic hydrodynamic trails in harbour seals (*Phoca vitulina*). *Journal of Experimental Biology* 210: 781–787.

348 Schulze, C., A. Spaethe, and Z. Halata. 1993. The sensory innervation of the gingiva and mucosa in *Monodelphis domestica* - an ultrastructural study. *Acta Anatomica* 146: 36–41.

349 Schuster, S. 2006. Integration of the electrosense with other senses: implications for communication. In *Communication in Fishes, Vol. 2* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 781–804. Enfield, NJ: Science Publishers.

350 Schwarz, S. and G. von der Emde. 2000. Distance discrimination during active electrolocation in the weakly electric fish *Gnathonemus petersii*. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 186: 1185–1197.

351 Schwarz, S. and G. von der Emde. 2000. Identification and categorization of artificial natural objects in the weakly electric fish *Gnathonemus petersii*. *European Journal of Neuroscience* 12: 202–202.

352 Shi, L., Y. Kodama, Y. Atsumi, S. Honma, and S. Wakisaka. 2005. Requirement of occlusal force for maintenance of the terminal morphology of the periodontal Ruffini endings. *Archives of Histology and Cytology* 68: 289–299.

353 Shimozawa, T., T. Kumagai, and Y. Baba. 1998. Structural scaling and functional design of the cercal wind-receptor hairs of cricket. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 183: 171–186.

354 Shimozawa, T., J. Murakami, and T. Kumagai. 2003. Cricket wind receptors: thermal noise for the highest sensitivity known. In *Sensors and Sensing in Biology and Engineering* (F. G. Barth, J. A. C. Humphrey, and T. Secomb, eds.), pp. 145–157. Berlin, Germany: Springer.

355 Shine, R., D. O'Connor, and R. T. Mason. 2000. Sexual conflict in the snake den. *Behavioral Ecology and Sociobiology* 48: 392–401.

356 Shine, R., M. P. LeMaster, I. T. Moore, M. M. Olsson, and R. T. Mason. 2001. Bumpus in the snake den: Effects of sex, size, and body condition on mortality of red-sided garter snakes. *Evolution* 55: 598–604.

357 Shiono, H. and Y. Naitoh. 1997. Cellular contraction precedes membrane depolarization in *Vorticella convallaria*. *Journal of Experimental Biology* 200: 2249–2261.

358 Shunatova, N. N. and C. Nielsen. 2002. Putative sensory structures in marine bryozoans. *Invertebrate Biology* 121: 262–270.

359 Silva, A., L. Quintana, M. Galeano, P. Errandonea, and O. Macadar. 1999. Water temperature sensitivity of EOD waveform in *Brachyhypopomus pinnicaudatus*. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 185: 187–197.

360 Simmons, M. N. and J. S. Jones. 2007. Male genital morphology and function: an evolutionary perspective. *Journal of Urology* 177: 1625–1631.

361 Singla, V. and J. F. Reiter. 2006. The primary cilium as the cell's antenna: Signaling at a sensory organelle. *Science* 313: 629–633.

362 Sisneros, J. A., T. C. Tricas, and C. A. Luer. 1998. Response properties and biological function of the skate electrosensory system during ontogeny. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 183: 87–99.

363 Sisneros, J. A. and T. C. Tricas. 2002. Neuroethology and life history adaptations of the elasmobranch electric sense. *Journal of Physiology-Paris* 96: 379–389.

364 Sisneros, J. A. and T. C. Tricas. 2002. Ontogenetic changes in the response properties of the peripheral electrosensory system in the Atlantic stingray (*Dasyatis sabina*). *Brain Behavior and Evolution* 59: 130–140.

365 Sneddon, L. U. 2007. Nociception. In *Sensory Systems and Neuroscience, Vol. 25, Fish Physiology Series* (T. J. Hara and B. S. Zielinski, eds.), pp. 153–178. New York: Elsevier/Academic Press.

366 Spoon, T. R., J. R. Millam, and D. H. Owings. 2006. The importance of mate behavioural compatibility in parenting and reproductive success by cockatiels, *Nymphicus hollandicus*. *Animal Behaviour* 71: 315–326.

367 Squire, A. and P. Moller. 1982. Effects of water conductivity on electro-communication in the weak electric fish *Brienomyrus niger* (Mormyriformes). *Animal Behaviour* 30: 375–382.

368 Steinmann, T., J. Casas, G. Krijnen, and O. Dangles. 2006. Air-flow sensitive hairs: boundary layers in oscillatory flows around arthropod appendages. *Journal of Experimental Biology* 209: 4398–4408.

369 Stoddard, P. K., B. Rasnow, and C. Assad. 1999. Electric organ discharges of the gymnotiform fishes: III. *Brachyhypopomus*. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 184: 609–630.

370 Stoddard, P. K. 2002. Electric signals: predation, sex, and environmental constraints. In *Advances in the Study of Behavior, Vol. 31.*, pp. 201–242. San Diego: Academic Press Inc.

371 Stoddard, P. K. 2002. The evolutionary origins of electric signal complexity. *Journal of Physiology-Paris* 96: 485–491.

372 Stoddard, P. K. 2006. Plasticity of the electric organ discharge waveform: contexts, mechanisms, and implications for electrocommunication. In *Communication in Fishes, Vol. 2* (F. Ladich, S. P. Collin, P. Moller, and B. G. Kapoor, eds.), pp. 623–646. Enfield, NJ: Science Publishers.

373 Sundermann, G. 1983. The fine structure of epidermal lines on arms and head of post-embryonic *Sepia officinalis* and *Loligo vulgaris* (Mollusca, Cephalopoda). *Cell and Tissue Research* 232: 669–677.

374 Syntichaki, P. and N. Tavernarakis. 2004. Genetic models of mechanotransduction: The nematode *Caenorhabditis elegans*. *Physiological Reviews* 84: 1097–1153.

375 Szabo, T., P. S. Enger, A. J. Kalmijn, and T. H. Bullock. 1972. Microampullary organs and a submandibular sense organ in fresh water ray, *Potamotrygon*. *Journal of Comparative Physiology* 79: 15–27.

376 Takahashi-Iwanaga, H., T. Maeda, and K. Abe. 1997. Scanning and transmission electron microscopy of Ruffini endings in the periodontal ligament of rat incisor. *Journal of Comparative Neurology* 389: 177–184.

377 Takahashi-Iwanaga, H. 2000. Three-dimensional microanatomy of longitudinal lanceolate endings in rat vibrissae. *Journal of Comparative Neurology* 426: 259–269.

378 Takahashi-Iwanaga, H. and H. Shimoda. 2003. The three-dimensional microanatomy of Meissner corpuscles in monkey palmar skin. *Journal of Neurocytology* 32: 363–371.

379 Tamm, S. and S. Tamm. 1991. Actin pegs and ultrastructure of presumed sensory receptors of *Beroe* (Ctenophora). *Cell and Tissue Research* 264: 151–159.

380 Tautz, J. 1977. Reception of medium vibration by thoracal hairs of caterpillars of *Barathra brassicae* L. (Lepidoptera, Noctuidae). I. Mechanical properties of the receptor hairs. *Journal of Comparative Physiology* 118: 13–31.

381 Tautz, J. and H. Markl. 1978. Caterpillars detect flying wasps by hairs sensitive to airborne vibration. *Behavioral Ecology and Sociobiology* 4: 101–110.

382 Taylor, J. R., A. P. Lockwood, and A. J. Taylor. 1996. The prepuce specialized mucosa of the penis and its loss to circumcision. *British Journal of Urology* 77: 291–295.

383 Tominaga, T. and Y. Naitoh. 1994. Comparison between thermoreceptor and mechanoreceptor currents in *Paramecium caudatum*. *Journal of Experimental Biology* 189: 117–131.

384 Toyoshima, K. 1993. Are Merkel and Grandry cells two varieties of the same cell in birds? *Archives of Histology and Cytology* 56: 167–175.

385 Triblehorn, J. D. and D. D. Yager. 2006. Wind generated by an attacking bat: anemometric measurements and detection by the praying mantis cercal system. *Journal of Experimental Biology* 209: 1430–1440.

386 Tricas, T. C., S. W. Michael, and J. A. Sisneros. 1995. Electrosensory optimization to conspecific phasic signals for mating. *Neuroscience Letters* 202: 129–132.

387 Tricas, T. C. and J. A. Sisneros. 2004. Ecological functions and adaptations of the elasmobranch electrosense. In *The Senses of Fish: Adaptations for the Reception of Natural Stimuli* (G. von der Emde, J. Mogdans, and B. G. Kapoor, eds.), pp. 308–329. Boston, MA: Kluwer Academic Publishers.

388 Turnbull, B. G. and D. D. Rasmusson. 1986. Sensory innervation of the raccoon forepaw. 1. Receptor types in glabrous and hairy skin and deep tissue. *Somatosensory Research* 4: 43–62.

389 Tyack, P. L. 2000. Functional aspects of cetacean communication. In *Cetacean Societies: Field Studies of Dolphins and Whales* (J. Mann, R. C. Connor, P. L. Tyack, and H. Whitehead, eds.), pp. 270–307. Chicago, IL: University of Chicago Press.

390 Uher, R. F. 1968. *Ethology of Mammals*. New York: Plenum Press.

391 Umnova, M. M. and I. B. Krasnov. 2003. Ultrastructure of muscle spindles (mechanoreceptors) of Rat m. soleus after support unloading and its combination with hypergravity. *Biology Bulletin* 30: 101–109.

392 Vasconcellos-Neto, J. and P. Jolivet. 1994. Cycloalexy among chrysomelid larvae. In *Novel Aspects of the Biology of the Chrysomelidae* (P. Jolivet, M. L. Cox, and E. Petitpierre, eds.), pp. 303–309. Boston, MA: Kluwere Academic Publishers.

393 Videler, J. J., U. K. Muller, and E. J. Stamhuis. 1999. Aquatic vertebrate locomotion: wakes from body waves. *Journal of Experimental Biology* 202: 3423–3430.

394 Videler, J. J., E. J. Stamhuis, U. K. Muller, and L. A. van Duren. 2002. The scaling and structure of aquatic animal wakes. *Integrative and Comparative Biology* 42: 988–996.

395 von der Emde, G. 1990. Discrimination of objects through electrolocation in the weakly electric fish *Gnathonemus petersii*. *Journal of Comparative Physiology A* 167: 413–421.

396 von der Emde, G. and H. Bleckmann. 1997. Waveform tuning of electroreceptor cells in the weakly electric fish, *Gnathonemus petersii*. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 181: 511–524.

397 von der Emde, G. 1998. Capacitance detection in the wave-type electric fish *Eigenmannia* during active electrolocation. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 182: 217–224.

398 von der Emde, G., S. Schwarz, L. Gomez, R. Budelli, and K. Grant. 1998. Electric fish measure distance in the dark. *Nature* 395: 890–894.

399 von der Emde, G. 1999. Active electrolocation of objects in weakly electric fish. *Journal of Experimental Biology* 202: 1205–1215.

400 von der Emde, G. and S. Schwarz. 2002. Imaging of objects through active echolocation in *Gnathonemus petersii*. *Journal of Physiology-Paris* 96: 431–444.

401 von der Emde, G. 2004. Distance and shape: perception of the 3-dimensional world by weakly electric fish. *Journal of Physiology-Paris* 98: 67–80.

402 von der Emde, G. 2007. Electroreception: object recognition in African weakly electric fish. In *Sensory Systems and Neuroscience, Vol. 25, Fish Physiology Series* (T. J. Hara and B. S. Zielinski, eds.), pp. 307–336. New York: Elsevier/Academic Press.

403 von Düring, M. and W. Seiler. 1974. The fine structure of lamellated receptors in the skin of *Rana esculenta*. *Zeitschrift für Anatomie und Entwicklungsgeschichte* 144: 165–172.

404 von Düring, M. and M. R. Miller. 1979. Sensory nerve endings of the skin and deeper structures. In *Biology of the Reptilia, Vol. 9* (C. Gans, R. G. Northcutt, and P. Ulinski, eds.), pp. 407–441. London, UK: Academic Press.

405 Wakisaka, S., Y. Atsumi, S. H. Youn, and T. Maeda. 2000. Morphological and cytochemical characteristics of periodontal Ruffini ending under normal and regeneration processes. *Archives of Histology and Cytology* 63: 91–113.

406 Walther, F. R. 1984. *Communication and Expression in Hoofed Mammals*. Bloomington, IN: Indiana University Press.

407 Ward, S., N. Thomson, J. G. White, and S. Brenner. 1975. Electron microscopical reconstruction of anterior sensory anatomy of nematode *Caenorhabditis elegans*. *Journal of Comparative Neurology* 160: 313–337.

408 Watts, R. E. and A. S. French. 1985. Sensory transduction in dorsal cutaneous mechanoreceptors of the frog, *Rana pipiens*. *Journal of Comparative Physiology A-Sensory Neural and Behavioral Physiology* 157: 657–665.

409 Webb, J. F. 1989. Gross morphology and evolution of the mechanoreceptive lateral line system in teleost fishes. *Brain Behavior and Evolution* 33: 34–53.

410 Weissengruber, G. E., M. Egerbacher, and G. Forstenpointner. 2005. Structure and innervation of the tusk pulp in the African elephant (*Loxodonta africana*). *Journal of Anatomy* 206: 387–393.

411 Weissengruber, G. E., G. F. Egger, J. R. Hutchinson, H. B. Groenewald, L. Elsasser, D. Famini, and G. Forstenpointner. 2006. The structure of the cushions in the feet of African elephants (*Loxodonta africana*). *Journal of Anatomy* 209: 781–792.

412 White, E. G. 1918. The origin of the electric organs in *Astroscopus guttatus*. *Papers from the Department of Marine Biology of the Carnegie Institution of Washington* 252: 141–172.

413 Whitehead, H. and L. Weilgart. 2000. The sperm whale: social females and roving males. In *Cetacean Societies: Field Studies of Dolphins and Whales* (J. Mann, R. C. Connor, P. L. Tyack, and H. Whitehead, eds.). Chicago, IL: University of Chicago Press, pp. 154–172.

414 Wiese, K. 1988. The representation of hydrodynamic paramters in the CNS of the crayfish *Procambarus*. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 665–683. New York: Springer-Verlag.

415 Wild, J. M., H. Reinke, and S. M. Farabaugh. 1997. Non-thalamic pathway contributes to a whole body map in the brain of the budgerigar. *Brain Research* 755: 137–141.

416 Wild, J. M., M. F. Kubke, and C. E. Carr. 2001. Tonotopic and somatotopic representation in the nucleus basalis of the barn owl, *Tyro alba*. *Brain Behavior and Evolution* 57: 39–62.

417 Wilkens, L. A. 2004. Adaptation of the rostral ampullary electrosense for plankton feeding by the paddlefish. In *The Senses of Fish: Adaptations for the Reception of Natural Stimuli* (G. von der Emde, J. Mogdans, and B. G. Kapoor, eds.), pp. 288–307. Boston, MA: Kluwer Academic Publishers.

418 Wilkens, L. A. and M. H. Hofmann. 2005. Behavior of animals with passive, low-frequency electrosensory systems. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 229–263. New York, NY: Springer Science+Business Media.

419 Wilson, E. O. 1971. *The Insect Societies*. Cambridge, MA: Belknap Press.

420 Winkelmann, R. K. 1959. The erogenous zones- their nerve supply and its significance. *Proceedings of the Staff Meetings of the Mayo Clinic* 34: 39–47.

421 Witz, B. W. 1990. Antipredator mechanisms in arthropods - a 20 year literature survey. *Florida Entomologist* 73: 71–99.

422 Wright, K. A. 1992. Peripheral sensilla of some lower invertebrates - the Platyhelminthes and Nematoda. *Microscopy Research and Technique* 22: 285–297.

423 Yack, J. E. 2004. The structure and function of auditory chordotonal organs in insects. *Microscopy Research and Technique* 63: 315–337.

424 Yamashita, Y. and H. Ogawa. 1991. Slowly adapting cutaneous mechanoreceptor afferent units associated with Merkel cells in frogs and effects of direct currents. *Somatosensory and Motor Research* 8: 87–95.

425 Yoshimura, K. 1996. A novel type of mechanoreception by the flagella of Chlamydomonas. *Journal of Experimental Biology* 199: 295–302.

426 Yoshimura, K. 1998. Mechanosensitive channels in the cell body of Chlamydomonas. *Journal of Membrane Biology* 166: 149–155.

427 Zakon, H. 1988. The electroreceptors: diversity in structure and function. In *Sensory Biology of Aquatic Animals* (J. Atema, R. R. Fay, A. N. Popper, and W. N. Tavolga, eds.), pp. 813–850. New York: Springer-Verlag.

428 Zakon, H. H. 1986. The electroreceptive periphery. In *Electroreception* (T. H. Bullock and W. Heiligenberg, eds.), pp. 103–156. New York: John Wiley and Sons.

429 Zelena, J., Z. Halata, V. Szeder, and M. Grim. 1997. Crural Herbst corpuscles in chicken and quail: numbers and structure. *Anatomy and Embryology* 196: 323–333.

430 Zupanc, G. K. H. 2002. From oscillators to modulators: behavioral and neural control of modulations of the electric organ discharge in the gymnotiform fish, Apteronotus leptorhynchus. *Journal of Physiology-Paris* 96: 459–472.

431 Zupanc, G. K. H. and T. H. Bullock. 2005. From Electrogenesis to electroreception: an overview. In *Electroreception* (T. H. Bullock, C. D. Hopkins, A. N. Popper, and R. R. Fay, eds.), pp. 5–46. New York, NY: Springer Science+Business Media.

432 Zupanc, G. K. H., R. F. Sirbulescu, A. Nichols, and I. Ilies. 2006. Electric interactions through chirping behavior in the weakly electric fish, *Apteronotus leptorhynchus*. *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology* 192: 159–173.