

Contents

Preface, vi

1 The biology of behaviour

- 1.1 Why do animals behave?, 1
- 1.2 What is behaviour?, 8
- 1.3 Evolution, 11
- 1.4 Natural selection and adaptation, 20
- 1.5 Summary, 24
- 1.6 Further reading, 25

2 The machinery of behaviour

- 2.1 The spider's web, 26
- 2.2 The nervous system, 32
- 2.3 The sensory system, 35
 - 2.3.1 The organs of sense, 35
 - 2.3.2 Echolocation in bats, 37
- 2.4 Putting sensory information to use, 39
- 2.5 The control of behaviour, 43
 - 2.5.1 Choices among behaviour patterns, 43
 - 2.5.2 Hormones, 46
- 2.6 Summary, 48
- 2.7 Further reading, 49

3 The genetics and development of behaviour

- 3.1 The principles of genetics, 50
- 3.2 Behavioural genetics, 56
- 3.3 Development, 59
- 3.4 Imprinting, 62
- 3.5 Learning and memory, 64
 - 3.5.1 Non-associative learning: habituation and sensitization, 64
 - 3.5.2 Associative learning: classical and operant conditioning, 66
 - 3.5.3 How chaffinches learn chaffinch song, 68
 - 3.5.4 Memory, 71
- 3.6 The instinct controversy, 73
- 3.7 Culture in animals, 76
- 3.8 Summary, 82
- 3.9 Further reading, 83

4 Movements and migration

- 4.1 The principles of migration, 84
- 4.2 Homing, 88
 - 4.2.1 Local landmarks and home cues, 88
 - 4.2.2 Pigeon homing, 92
- 4.3 Summary, 99
- 4.4 Further reading, 100

CONTENTS

5 Eating and not being eaten

- 5.1 Eating, 101
- 5.2 Feeding in group-living herbivores, 102
- 5.3 Recognizing food, 106
- 5.4 Hunting food, 108
 - 5.4.1 Foraging on immobile prey, 108
 - 5.4.2 Group-hunting carnivores, 109
 - 5.4.3 A note on domestication, 111
- 5.5 Avoiding being eaten: active evasion, 112
- 5.6 Camouflage, 113
- 5.7 Warning coloration and mimicry, 114
- 5.8 Fish schooling, 118
- 5.9 Summary, 120
- 5.10 Further reading, 121

6 Signals

- 6.1 The principles of communication, 122
- 6.2 Bird song, 124
- 6.3 Pheromones, 127
- 6.4 The dance of the honey-bee, 131
 - 6.4.1 Its meaning, 131
 - 6.4.2 Decoding the dance language, 133
- 6.5 The evolution of signals, 136
- 6.6 Summary, 139
- 6.7 Further reading, 140

7 Fighting

- 7.1 Ritualized fighting, 142
- 7.2 Dominance, 147
- 7.3 Territoriality, 149
- 7.4 Summary, 154
- 7.5 Further reading, 154

8 Sexual behaviour

- 8.1 Choosing a member of the right species, 157
- 8.2 Sexual selection, 161
- 8.3 The struggle of males for females, 164
- 8.4 Courtship and female choice, 166
- 8.5 Systems of reproduction, 170
- 8.6 Summary, 175
- 8.7 Further reading, 176

9 Altruism and social life

- 9.1 The natural selection of altruism, 177
- 9.2 Helpers at the nest, 181
- 9.3 Insect societies, 185
 - 9.3.1 The social life of insects, 185
 - 9.3.2 Altruism in insect societies, 186

CONTENTS

- 9.4 Recognizing relatives, 188
- 9.5 Primate societies, 190
 - 9.5.1 The social life of primates, 190
 - 9.5.2 Altruism in primates, 193
- 9.6 Manipulated altruism: the control of behaviour by parasites, 194
- 9.7 Summary, 198
- 9.8 Further reading, 199

Epilogue, 200

References, 202

Index, 205