# Contents

Preface 5
Introduction by Steven P R Rose and Neil Chalmers 9

## Section I Structure, function and development of the nervous system

Introductory note to section I 13

- 1 The synapse by John Eccles 14
- 2 How cells communicate by Bernhard Katz 29
- 3 How the cerebellum may be used by Stephen Blomfield and David Marr 41
- 4 The evolution of the central nervous system by Alfred Sherwood Romer 48
- 5 The contraction of muscle by H E Huxley 69

## Section II Sensory processes and perception

Introductory note to section II 82

- 6 The origin of the ear by Alfred Sherwood Romer 83
- 7 The ear by Georg von Békésy 93
- 8 Photoreception by E J W Barrington 106
- 9 The eye by Alfred Sherwood Romer 113
- 10 The visual cortex of the brain by David H Hubel 122
- 11 Three-pigment color vision by Edward F MacNichol Jr 133

#### Section III Emotion and motivation

Introductory note to section III 145

- 12 Ulcers in executive monkeys by Joseph V Brady 146
- 13 Attitude and pupil size by Richard H Hess 151
- 14 Eating and drinking elicited by direct adrenergic or cholinergic stimulation of the hypothalamus by S P Grossman 162
- 15 The biochemistry of behaviour by Samuel Eiduson 164
- 16 Emotional centres in the brain by James Olds 171
- 17 The perception of pain by Ronald Melzack 179
- 18 The reticular formation by J D French 191
- 19 The states of sleep by Michel Jouvet 199

## Section IV Learning, memory and intelligence

Introductory note to section IV 211

- 20 Information and memory by George A Miller 212
- 21 The great cerebral commissure by R W Sperry 219
- 22 The biochemical approach to memory by Steven P R Rose 232
- 23 Race, intelligence and IQ: a debate by A R Jensen, J Hirsch, L Hudson, Steven P R Rose and M P M Richards 239
- 24 Learning to think by Harry F Harlow and Margaret Kuenne Harlow 249

## Section V Social behaviour

Introductory note to section V 255

- 25 Courtship and threat display by Robert A Hinde 256
- 26 Evolutionary change in primate societies by John Hurrell Crook 262
- 27 Status and superstatus by Desmond Morris 268
- 28 The spontaneity of aggression by Konrad Lorenz 273
- 29 The nature of aggression by Robert A Hinde 276

## Section VI Models, machines and minds

Introductory note to section VI 280

- 30 A brief history of neural modelling by L D Harmon and E R Lewis 281
- 31 Man on his nature by C S Sherrington 289
- 32 Consciousness by E D Adrian 298
- 33 The bankruptcy of determinism by Donald M MacKay 303
- 34 The physical basis of mind by Viscount Samuel, A J Ayer and Gilbert Ryle 306

Glossary 311

Index 313