

Author Index

- Abrams, R. M., 111, 113
 Abu Gideiri, Y. B., 75
 Adam, J. H., 224
 Adams, A. W., 262
 Adams, C. E., 228
 Adams, D. B., 170
 Adler, N. T., 219
 Adrian, E. D., 30
 Aidley, D. J., 23, 57
 Ainley, D. G., 113–5
 Ainsworth, M. D., 174, 229
 Akindele, M. O., 117
 Akinlosotu, T. A., 132
 Albon, S. D., 208–9
 Albright, J. L., 174, 231, 249,
 253, 257, 259, 260–1, 262
 Alcock, J., 182, 195
 Aldrich-Blake, F. P. G., 244
 Alexander, G., 137, 261
 Alexander, R. D., 226
 Allee, W. C., 178, 185, 248,
 252, 260
 Allin, J. T., 112
 Allison, T., 116
 Al-Rawi, B., 258, 262
 Altmann, J., 136, 187, 243
 Altmann, S. A., 92, 124, 136,
 141–2, 242–3, 244, 246
 Amelang, W., 43, 47
 Anand, B. K., 146
 Anderson, J. C., 262
 Anderson, L. T., 130
 Andersson, B., 91, 107–8, 112
 Andersson, M., 188
 Andrew, R. J., 59, 60, 89, 97,
 169, 171, 247
 Antelman, S. M., 147
 Arave, C. W., 262
 A.R.C., 151, 152
 Archer, J., 93, 97, 120, 122,
 168, 169, 258
 Ariëns Kappers, C. U., 46
 Armsby, H. P., 152
 Armstrong, E. A., 203
 Arnold, G. W., 150–1,
 153–4, 156, 235, 236, 237,
 249, 261
 Arnold, W. J., 217
 Aschoff, J., 21
 Ashcroft, R., 200
 Assem, J. van den., 199
 Atkinson, S., 230
 Attneave, F., 60
 Augenstein, L., 96
 Baerends, G. P., 62
 Baeumer, E., 20
 Baile, C. A., 153–4
 Bailey, W. J., 165, 166
 Baker, R. D., 154
 Baker, R. R., 201
 Balagura, S., 144
 Balch, C. C., 153
 Baldwin, B. A., 111, 113, 122,
 235, 237
 Baldwin, P. J., 165
 Ball, B. G., 211
 Banerjee, M. G., 146
 Banks, E. M., 112, 236, 252
 Baranyovits, F., 119
 Barash, S., 246
 Bareham, J. R., 262
 Barfield, R. J., 216, 222
 Barker, J. M., 154
 Barlow, G. W., 62–3, 73, 91,
 209, 214, 244
 Barlow, H. B., 49, 52, 55
 Barnett, S. A., 168, 169, 174
 Baron, A., 256
 Barr, G. R., 260
 Barraclough, C. A., 91, 218
 Bartholomew, G. A., 110
 Barton, E. P., 253, 260
 Baryshnikov, I. A., 174
 Bastock, M., 86, 98, 215
 Bateman, J. J., 203
 Bateson, P. P. G., 19, 210,
 214, 224, 243
 Beach, F. A., 217, 219
 Bedard, W. D., 237
 Beer, C. G., 215, 216
 Behmann, R., 39
 Beilharz, R. G., 234, 236, 249,
 260
 Bekoff, A., 114–5
 Bekoff, M., 114–5, 209
 Bell, R. Q., 219
 Bell, S. M. V., 174
 Bellairs, A. d'A., 110
 Bellows, R. T., 106
 Belovsky, G. E., 150
 Benedictis, P. A., 148
 Bennett, M. V. L., 30
 Bentley, D. R., 68–71, 75
 Bentley, P. J., 105
 Benzer, S., 75
 Berkson, G., 99
 Berlyne, D. E., 88
 Bernays, E. A., 141
 Bernstein, I. S., 253
 Bernuth, H. von., 229
 Beroza, M., 237–8
 Bertram, B. C. R., 189–90,
 194
 Bertrand, M., 230
 Best, S. M., 97
 Bethel, W. M., 130
 Beukema, J. J., 132–3, 144
 Bierl, B. A., 238
 Bindra, D., 88, 98
 Binkley, S., 100
 Binns, T. J., 119
 Birch, M. C., 237
 Birke, L. I. A., 97
 Bishop, N., 258
 Bishop, P. O., 50
 Black, W. C., 249, 257, 261
 Blakemore, C., 15, 52, 53–5
 Blass, E. M., 228
 Blaxter, K. L., 152, 153
 Bleakley, W. R., 109
 Blest, A. D., 38
 Blockey, M. A. de B., 235,
 260
 Bodmer, W. F., 210
 Boerema, L. K., 33
 Bol, A. C. A., 59, 98, 113
 Bolles, R. C., 16, 58, 82, 87–8
 Bond, T. E., 106, 262
 Booth, D. A., 146–7
 Borchelt, P. L., 113
 Borchers, H-W., 47
 Bornstein, M. B., 74
 Bossert, W. H., 202
 Bouissou, M-F., 253, 264
 Boundy, C. A. P., 237
 Bourke, M. E., 235
 Bourlière, F., 163, 164, 166
 Bowman, R. E., 99
 Bowly, J., 229, 230, 257
 Boycott, B. B., 50
 Box, H. O., 229, 243, 247
 Bradbury, J. W., 189, 205
 Brady, J. V., 123
 Brakel, W. J., 262
 Bramley, P. S., 196
 Branch, G. M., 167
 Branchek, R. S., 113
 Brattgård, S-O., 53
 Brecher, G., 147
 Breder, C. M., 160, 179, 245
 Breed, M. D., 211
 Brenner, R. M., 219
 Brenner, S., 75
 Bretz, W. L., 109
 Broadbent, D. E., 55, 89, 97
 Brobeck, J. R., 112, 146
 Brock, V. E., 188
 Brockelman, W. Y., 225
 Brockway, B. F., 217
 Brody, P., 216
 Brody, S., 153
 Broom, D. M., 20, 21, 60, 90,
 92, 93–4, 100, 112, 131,
 132, 155, 169, 172, 173, 174,
 177, 179, 180, 186, 227, 228,
 231, 236, 254, 256, 257, 261
 Brower, J. V. Z., 161
 Brown, C. M., 231
 Brown, J. H., 147
 Brown, J. L., 12, 13, 190
 Brown, J. S., 87
 Brown, W. J., 236
 Brownlee, A., 113, 258
 Bruce, M., 229
 Bruner, J. S., 258
 Bryant, M. J., 234, 235, 252,
 262
 Buck, J., 206
 Budgeff, P., 109
 Buechner, H. K., 189
 Buggy, J., 107
 Bullis, H. R., 183
 Bullock, T. H., 21, 28, 64
 Burgess, J. W., 244
 Burkholder, W. D., 237
 Burn, J., 174
 Burrows, M., 74
 Butcher, D. F., 260
 Butenandt, A., 39
 Caffyn, Z. E. Y., 147
 Caggiula, A. R., 218
 Calaresu, F. R., 145–6
 Caldarola, P. C., 100
 Calder, W. A., 147
 Caldwell, F. T., 111, 113
 Calhoun, J. B., 258
 Cameron, E. A., 237
 Campling, R. C., 153, 155
 Cane, V. B., 60, 92
 Cannon, R. E., 171
 Cannon, W. B., 4, 120
 Carlisle, T. R., 222
 Carlson, N. R., 54, 232–3
 Carmichael, L., 74
 Carpenter, C. C., 252
 Carpenter, C. R., 243
 Carpenter, F. L., 148, 150
 Carpenter, G. D. H., 166
 Carr, W. J., 118, 173
 Carrick, M. J., 237
 Carruthers, M., 122
 Cassidy, M. D., 142
 Castilla, J. C., 130
 Castro, J. M. de, 144
 Catchpole, C. K., 200–01,
 207
 Cavalli-Sforza, L. L., 210
 Cavanaugh, E. B., 91, 218
 Chacon, E., 150–1, 153–5
 Chalmers, D. V., 169

Author index

- Chalmers, N. R., 219, 240, 246, 247, 258
Chambers, D. T., 156
Chamove, A. S., 231
Champ, B. R., 119
Chance, M. R. A., 164, 240
Chang, K.-J., 121
Charnov, E. L., 128, 133, 134, 135, 138, 149, 167, 195, 207
Chase, M. H., 170
Chatfield, C., 71, 73
Chelidze, L. R., 53
Cheney, D. L., 257
Cheng, M.-F., 232
Cherrett, J. M., 39
Chivers, D. J., 136
Chkikvadze, I. I., 53
Chow, K. L., 15, 53
Christian, J. J., 258
Claridge, M. F., 142
Clark, R. B., 172
Clark, R. M., 152, 153
Clark, T. O., 235
Clemente, C. D., 170, 218
Clough, G. C., 258
Clutton-Brock, T. H., 129, 190, 208–9, 227, 244, 247
Cody, M. L., 133, 182
Coghill, G. E., 74
Cohen, J. E., 242–3
Cohen, S., 90, 95
Collett, T., 55
Collias, N. E., 237
Collis, K. A., 262
Colovos, N. R., 152, 153
Cooke, F., 209
Cooper, G. F., 15, 54
Coppel, H. C., 237
Corbett, J. L., 152
Corner, G. W., 169
Corner, M. A., 117
Cosbey, E. S., 100
Coss, R. G., 37
Cott, H. B., 38, 159, 166
Coulson, J. C., 186, 203
Coury, J. N., 107
Covey, A., 142
Cowie, A. T., 236
Cowper, L. J., 152
Cox, C. R., 210–11
Cragg, B. G., 53
Craig, W., 216
Crain, S. M., 74
Crane, J., 251
Critchlow, B. V., 91, 218
Crook, J. H., 9, 203–4, 209
Crosby, E. C., 46
Cross, B. A., 91, 218, 236
Cross, W. B., 255
Crow, J. F., 210
Crowden, A. E., 131, 132
Crowley, J. P., 237
Cruze, W. W., 19
Cuatrecasas, P., 121
Cullen, J. M., 181
Culshaw, A. D., 90, 93
Cunningham, F. J., 218
Curio, E., 138, 159, 182
Daan, S., 161
Dale, J., 151
Daly, M., 169
Darby, T. E., 237
Darwin, C., 9, 262
Daumer, K., 39
Davenport, R. G., 174
Davidson, J. M., 222
Davies, L., 230
Davies, N. B., 197–9, 206, 208, 251
Davis, H., 24, 27
Davis, J. M., 187
Davis, J. W. F., 203
Davis, G. T., 249
Dawkins, M., 60, 63, 91, 105, 137
Dawkins, R., 10, 15, 20, 60, 63, 91, 92, 105, 126, 132, 158, 193, 195, 222–3, 225–6
Deag, J. M., 253–5
Dejours, P., 103
Delius, J. D., 39, 60, 88, 92, 96, 98, 113–4
Denenberg, V. H., 122, 174, 232
Desiraju, T., 146
Dethier, V. G., 27, 142, 147
DeVore, I., 211, 239
Devos, M., 145
Dewsbury, D. A., 218, 232
Diakow, C., 217, 221
Diamond, L., 219
Diamond, M., 219
Dick, W. J. A., 180, 186, 254
Dickson, D. P., 260
Diecke, F. P. J., 28
Dietrich, J. P., 249
Dijkgraaf, S., 28
Dimond, S. J., 224
Dobson, C. W., 71
Dolphinow, P. J., 258
Dominey, W. J., 205
Donaldson, S. L., 249, 253, 257, 259, 260, 261
Donnelly, E. D., 151
Dorsett, D. A., 64–7
Doty, R. W., 63–4, 105
Dowling, J. E., 50
Drent, R. H., 134, 136, 224
Drewett, R. F., 228
Dudziński, M. L., 150–1, 156, 235, 237
Duffy, E., 87–8
Dunbar, E. P., 254
Dunbar, R. I. M., 254
Duncan, I. J. H., 122, 144, 260
Dunnet, G. M., 238
Dunsmore, D. G., 249
Dyer, I. A., 151, 156
Dyde, C. E., 119
Eccles, J. C., 57–8
Edgerton, V. R., 100
Edmunds, M., 38, 157–60
Edney, E. B., 105
Edwards, S. A., 227, 236
Edwards, W., 80
Eibl-Eibesfeldt, I., 33, 43, 63, 159, 206
Eisenberg, J. F., 204, 244, 248
Eisner, T., 167
Ellefson, J. O., 197, 243
Elner, R. W., 135
Elwood, R. W., 112, 224, 226, 228, 256
Emlen, J. M., 8, 127, 128, 138, 183
Emlen, J. T., 173
Emlen, S. T., 190, 204–5
Emmerton, J., 39
Engelmann, T. G., 101–2
Engen, T., 104
Enright, J. T., 102, 116
Epple, G., 243
Epstein, A. N., 107, 147
Ercanbrack, S. K., 235
Erickson, J. T., 135
Erickson, C. J., 211, 216, 231
Ervin, F. R., 139, 141
Erslemont, R. J., 234
Estes, W. K., 87
Euler, U. S. von, 121
Evans, H. E., 187
Evans, J. I., 117
Evans, L. T., 253
Evans, M. E., 243
Evans, S. M., 172, 184
Evarts, E. V., 58
Evoy, W. H., 74
Ewbank, R., 249, 252, 253, 262
Ewert, J.-P., 42–3, 46–8, 165, 173
Ewing, L. S., 211
Fabricius, E., 19, 212
Fagen, R. M., 258
Falk, J. L., 107
Falls, J. B., 134–5
Fantino, E., 123
Fantz, R. L., 20, 35–6, 229
F.A.O., 150
Farrell, W. M., 118
Feldberg, W., 112
Fenlon, J. S., 154
Fentress, J. C., 56–7, 58–9, 61–2, 63, 90, 93, 99
Ferguson, R. S., 249
Fernandez de Molina, A., 171
Finch, S., 39, 142, 238
Findlay, J. D., 109
Finney, G. H., 209
Fisher, A. E., 107
Fisher, E. W., 236
Fisher, J., 181
Fisher, N. E., 147
Fisher, R. A., 9, 12, 161, 202
Fitch, M. D., 38
Fitch, W. M., 14
Fitzsimons, J. T., 86, 106–8
Fohrman, M. H., 252–3, 262
Flagg, W., 108
Fleming, A. S., 233
Fleshler, M., 169
Foenander, F., 255, 260
Follett, B. K., 218
Folley, S. J., 236
Forbes, J. M., 153–4
Ford, J. B., 39
Fordham, R. A., 238
Foreman, D., 252
Forrester, R. C., 90, 93–4, 100, 170
Fothergill, L. A., 121
Fox, M. W., 98
Franck, D., 186
Frank, F., 258
Fraser, A. F., 234, 235
Fraser, D., 122
Fraser Darling, F. F., 186, 243, 248
Frazetta, T. H., 62
Freeland, W. J., 141, 151
Freeman, A. E., 260
Freeman, B. M., 19, 123
Frenk, S., 49
Fretter, V., 124, 167
Fretwell, S. D., 225
Friedman, L., 28
Friedman, M. I., 146
Friend, T. H., 254
Frisch, K. von., 39, 180
Fromme, A., 74
Fry, C. H., 190
Fuenzalida, C. E., 209
Furuya, Y., 248
Fusco, M. M., 112
Gadbury, J. C., 249
Gadgil, M., 201, 202
Galambos, R., 39, 117
Galef, B. G., 258
Gallagher, J. E., 214
Galton, F., 186
Gandelman, R., 122, 232
Gandini, G., 165
Garel, J. P., 237
Garcia, J., 139, 141
Gartlan, J. S., 253
Gass, C. L., 147
Gaston, L. K., 237
Gaze, R., 46
Geist, V., 242, 251
Genova, P., 258
Gettings, P. A., 66
Gibb, J. A., 129
Gibson, E. J., 118
Gibson, R. M., 208–9
Giffin, F., 54
Gilbert, W. M., 180
Gilder, P. M., 214
Gill, F. B., 147, 148, 197
Gillary, H. L., 30
Gilmore, G. I., 127
Glass, E. H., 238
Glencross, R. G., 234
Glick, D., 122
Glickman, S. E., 169
Globus, A., 53
Goethe, F., 173
Golani, I., 58
Goldberg, M. E., 55
Goldsmith, T. H., 39, 148

Author index

307

- Collub, L., 140
 Goodall, J., 105, 140
 Goodman, E., 218
 Gordon, P. O., 122
 Goss-Custard, J. D., 132, 135, 138
 Gottlieb, G., 20, 75
 Gottman, J. M., 92
 Gould, J. L., 180
 Gower, D. M., 207
 Grafen, 222–3
 Graham, A., 124, 167
 Graham, N. McC., 152, 153
 Grant, A. J., 262
 Grant, C. V., 169
 Grant, K. A., 147
 Grant, R., 112
 Grant, V., 147
 Gray, J., 74
 Green, M., 173
 Green, M. C., 59
 Green, R., 173
 Greenhalgh, J. F. D., 152, 155
 Greenwood, P. J., 162
 Griffin, D. R., 39, 117
 Grillner, S., 74, 100
 Griswold, J. G., 113
 Groot, J. de., 218
 Groot, P. de., 180
 Grossman, L., 107
 Grossman, S. P., 77, 107
 Grota, L. J., 231
 Groves, P. M., 172
 Grubb, P., 197, 260
 Gruendel, A. D., 217
 Gueldner, R. C., 41
 Guhl, A. M., 251, 252, 254, 255, 259, 260
 Guinness, F. E., 209, 227
 Guiton, P., 212
 Guthrie, E. R., 87
 Guyomarc'h, J. C., 71, 100
 Guz, A., 103

 Hafez, E. S. E., 22, 151, 156, 235
 Hahn, R., 262
 Hailman, J. P., 34–6
 Haines, C. P., 238
 Hainsworth, F. R., 138, 145, 147–9, 197
 Haldane, J. B. S., 104
 Hale, E. B., 252
 Hall, C. S., 168
 Hall, D. J., 135
 Hall, E. T., 195
 Hall, J. C., 228
 Hall, K. R. L., 197, 239
 Hall, W. C., 153
 Halley, R. J., 154
 Halliday, T. R., 7, 96, 104, 206, 208
 Halperin, S., 181
 Hamburger, V., 75
 Hamilton, W. D., 9–10, 133, 183–4, 190–1, 193, 195, 223
 Hamilton, W. J., 32, 72, 75, 90, 166, 180, 207, 217
 Hammel, H. T., 111–2, 113
 Hanawalt, J. T., 74
 Hanks, J. B., 231
 Hansell, M. H., 160
 Hanson, F. E., 142
 Harcourt, A. H., 250
 Hardee, D. D., 41, 237
 Hardy, A. C., 159
 Hardy, J. D., 112
 Hare, H., 193–4, 203
 Harlow, H. F., 99, 169, 174, 217, 229, 231, 257
 Harlow, M. K., 231
 Harré, R., 257
 Harrington, R. B., 248
 Harris, G. W., 218, 221, 236
 Harrison, F., 112
 Hart, B., 217, 221
 Hart, F. M., 257
 Hartline, H. K., 44–5
 Hartmann, E. L., 116
 Harvey, P. H., 129, 162, 190, 244, 247
 Hassell, M. P., 128, 132
 Hausfater, G., 253
 Hauske, G., 73
 Hawkes, C., 39
 Hay, D. E., 209
 Hayes, H. H., 152, 153
 Hayes, J. R., 82
 Hayes, J. S., 59
 Hebb, D. O., 87, 173
 Hecker, E., 39
 Hediger, H., 98, 116, 163, 195
 Hedin, P. A., 237
 Hedworth-Witty, R., 122
 Heiligenberg, W., 73, 92
 Heimer, L., 217–8
 Hein, A., 55, 77–8, 118
 Heitman, H., 262
 Held, R., 77–78, 118
 Hemsworth, P. H., 236, 253
 Hendrey, D. P., 106
 Henry, C. S., 187, 188
 Hensel, H., 108, 112
 Henson, O. W., 55
 Herbert, I. V., 39
 Hernández-Peón, R., 89, 170
 Herrnstein, R. J., 38
 Herz, M. J., 172
 Hess, E. H., 19, 20
 Heuts, B. A., 214
 Hickey, W. C., 152
 Hidaka, T., 34, 39
 Higginbotham, A. C., 110
 Hilgard, E. R., 85
 Hill, J. H., 105
 Hill, R. M., 49, 55
 Hills, J. I., 28
 Hillyard, S. A., 89
 Hinde, R. A., 7, 16, 19, 22, 33, 49, 62, 77, 82, 86–8, 168, 181, 190, 196, 215, 217, 219, 226, 229–31, 232–3, 240–1, 247, 248, 257
 Hink, R. F., 89
 Hinsche, G., 42
 Hirsch, H. V. B., 15, 54
 Hirsch, J., 15
 Hock, F., 46
 Hock, R. J., 108
 Hodgson, J., 154
 Hoebel, B. G., 218
 Hoffman, B. M., 231
 Hoffman, W. E., 107
 Hogan, J. A., 5, 16–17, 88, 111, 189
 Holling, C. S., 136–7
 Holman, J. G., 38
 Holmes, J. C., 130
 Holmes, R. T., 197
 Holmes, W., 160
 Holst, E. von, 75–6, 91, 171
 Holter, J. B., 152, 153
 Hood, C. S., 238
 Hoogland, J. L., 186
 Horn, G., 49, 51, 55, 89, 172
 Horn, H. S., 180, 186
 Horne, A. R., 144
 Horridge, G. A., 74
 Horvath, T., 169
 Hotta, Y., 75
 Houston, A. I., 86, 96
 Howard, H. E., 196
 Howell, T. R., 110
 Hoy, R. R., 70–1
 Hoyle, G., 64–7
 Hrdy, S. B., 190, 229
 Hsü, F., 27
 Hubel, D. H., 49–53
 Huber, F., 67–70
 Huber, G. C., 46
 Hudson, J. W., 111
 Hudson, S. J., 237
 Hughes, B. O., 144
 Hughes, J., 121
 Hughes, R. E., 151
 Hughes, R. N., 104, 135, 139
 Hulet, E. V., 235
 Hull, C. L., 85, 87
 Humphrey, N. K., 38
 Humphrey, T., 75
 Hunsperger, R. W., 171
 Hutchings, C. S. L., 17
 Hutchins, M., 246
 Hutchison, H. G., 151
 Hutchison, J. B., 216, 217, 219, 222, 231
 Hutt, C., 99, 229
 Hutt, S. J., 99, 229
 Hyde, C. E., 109
 Hyland, S., 228

 Iersel, J. J. A. van, 59, 98, 113
 Ikeda, K., 74, 75
 Iki, M., 91
 Iles, J. F., 74
 Immelmann, K., 212–4
 Impekoven, M., 186, 224
 Ingle, D., 48
 Inkster, I. J., 235
 Irving, L., 108
 Irving, S. N., 120
 Isaacson, A. J., 136, 254
 Itani, J., 142, 210
 Ittner, N. R., 106
 Ivins, J. D., 151
 Jaafar, Z., 195
 Jacobson, D., 236
 James, H., 19
 James, J. W., 260
 Jamieson, W. S., 152
 Jansen, P., 218
 Janzen, D. N., 141, 151
 Jarman, P. J., 242
 Jasper, H. H., 117
 Jaworska, K., 169
 Jay, P., 211
 Jenkins, D., 199
 Jenkins, P. F., 73
 Jenni, D. A., 204
 Jennings, T., 184
 Jermy, T., 142–3
 Jewell, P. A., 195, 260
 Joffe, J. M., 219
 Johansson, G., 122
 Johnsgard, P. A., 215
 Johnson, A. K., 107
 Johnson, C. E., 180, 186, 254
 Johnson, D. F., 221
 Johnson, E., 109
 Johnson, R. P., 197
 Jolly, A., 201, 258
 Jolly, C. J., 240
 Jones, A. R., 252
 Jones, L. E., 123
 Jordan, P. A., 150
 Jouvet, M., 116–7
 Joyce, J. P., 152, 153

 Kagan, J., 88
 Kalat, J. W., 16
 Kalmjn, A. J., 28
 Kaplan, H., 228
 Kaplan, W. D., 75
 Katz, B., 25–26
 Kaufman, J. H., 244
 Kavanau, J. L., 105
 Kawai, M., 257
 Kawanaka, K., 247
 Kawasaki, M., 64
 Kay, S. J., 262
 Kear, J., 20
 Keating, M. J., 46
 Keenleyside, M., 244
 Keeton, W. T., 39
 Keiner, M., 221
 Keiper, R. R., 90
 Kelly, C. F., 106, 262
 Kelly, J. M., 75
 Kendeigh, S. C., 145
 Kennedy, D., 74
 Kenward, R. E., 186–7
 Keverne, E. B., 219, 220
 Khanna, S. M., 28
 Kiester, A. R., 131
 Kiley-Worthington, M., 175, 227, 235, 237
 Kilgour, R., 237, 249
 Kimura, K., 91
 Kimura, M., 210
 Kinder, E. F., 111
 King, J. A., 244
 King, M. G., 252
 Kirby, H. W., 169
 Kish, C. B., 256

Author index

Kitchen, D. W., 197, 198
 Klassen, W., 238
 Kleiber, M., 152
 Kleist, S., 17
 Kleitman, N., 101–2, 117
 Klinghammer, E., 212–3
 Klopfer, P. H., 130
 Kluth, E., 100
 Knight, M. L., 195
 Knipling, E. F., 237, 238
 Kodrick-Brown, A., 147
 Koelling, R. A., 139, 141
 Koford, C. B., 244
 Kohler, S. C., 231
 Kokorina, E. P., 174
 Kontogiannis, J. E., 145
 Koon, W. E., 110
 Kornhuber, H. H., 58
 Komisaruk, B. R., 219, 221, 231
 Konishi, M., 209, 219
 Kop, P. P. A. M., 214
 Kopenhaver, K. H., 219
 Kortlandt, A., 98
 Kosterlitz, H. W., 121
 Kow, L.-M., 219
 Kowalska, M., 169
 Kozak, W., 50
 Krebs, D. L., 194
 Krebs, J. R., 126, 131, 133, 135, 137–8, 149, 158, 167, 180–1, 195, 199–200
 Kreithen, M. L., 39
 Kruijt, J. P., 19, 20, 189, 212, 217, 256
 Kruuk, H., 17, 157, 182, 188
 Kuenen, D. J., 33–4
 Kuffler, S. W., 45, 49
 Kühme, W., 190
 Kullmann, E. J., 182
 Kummer, H., 215, 244, 249, 251, 253
 Kumiooshi, M., 91
 Kuo, Z. Y., 75
 Kupfermann, I., 64
 Kutsch, W., 68
 Kydd, D. D., 152

Labov, J. B., 224
 Labreque, G. C., 238
 Lacey, B. C., 88
 Lacey, J. I., 88, 169
 Lack, D., 203, 204
 Lade, A. D., 260
 Laing, W. I., 109
 Lakin, J., 112
 Lannoy, J. de., 212
 Larkin, S., 84–5, 90, 96
 Larsen, H. J., 261
 Larsson, R., 217–8
 Larsson, S., 112
 Las, A., 237
 Lashley, K. S., 219
 Lasiewski, R. C., 147
 Laties, V. G., 111
 Lazarus, J., 184, 187, 191
 Lea, S. E. G., 38
 Leaver, J. D., 155, 227, 231, 254, 257, 261

Le Boeuf, B. J., 210–11
 Lee, D. H. K., 109
 Lees, A. D., 130
 Lehman, U., 92, 100–02
 Lehrman, D. S., 216, 232
 Leiman, A. L., 75
 Leis, C. A., 262
 Leland, L., 244, 246
 Le Magnen, J., 106, 144–5
 Lemon, R. E., 71, 73
 Lenard, H. G., 229
 Le Neindre, P., 237
 Leon, M., 231, 232
 Leonard, C. M., 91, 218
 Leonard, D. E., 238
 Lenhardt, M. L., 237
 Lettvin, J. Y., 43–45
 Leventhal, A. G., 54
 Levick, W. R., 52, 53
 Levin, D. A., 141
 Levine, S., 122, 123, 169
 Levins, R., 127
 Levinson, G., 219
 Levy, D. M., 98
 Lewis, C., 221
 Lewis, D. B., 207
 Lill, A., 209
 Lillywhite, P. G., 28
 Limbaugh, C., 196
 Lincoln, G. A., 252
 Lindauer, M., 178
 Lindsay, D. R., 235, 237, 252
 Lindsley, D. B., 88
 Lipsitt, L. P., 104, 229
 Lipton, J. M., 111, 113
 Lisk, R. D., 221, 231
 Lissmann, H. W., 74
 Lloyd, I. H., 84
 Lloyd, J. A., 258
 Loewenstein, W. R., 25
 Logan, C. A., 123
 Logan, F. A., 81
 Lorenz, K., 16, 19, 32, 62, 86, 87, 172, 173, 212, 224
 Lotwick, W., 243
 Lovari, S., 216
 Loveland, D. H., 38
 Loy, J., 211
 Lubin, M., 232
 Lubbock, J., 39
 Lundberg, V., 122
 Lüscher, M., 178
 Lynch, J. J., 261

MacArthur, R. H., 8, 12, 127, 128, 201
 McBride, G., 253, 255, 260, 262
 McCance, R. A., 107
 McCann, S. M., 107
 McCleery, R. H., 7, 80–1, 84, 96
 McCosker, J. E., 165
 McCulloch, W. S., 43–5
 MacDonald, D. W., 251
 McDougall, W., 85
 McDowell, R. E., 109
 McEwan, A. D., 236

308

McFarland, D. J., 8, 16, 76, 79, 81–5, 86–7, 90, 94–6, 98, 100, 106, 108, 109, 111
 McGuigan, D. I., 118
 McKinney, F., 113, 215
 Mackintosh, N. J., 16
 McLoughlin, V. L., 228, 231
 McManus, J., 112, 228
 Macnair, M. R., 226
 McPhail, J. D., 209
 MacRoberts, M. H., 181
 Mabon, R. M., 156
 Machlis, L., 60, 91
 Maeno, T., 91
 Magoun, H. W., 88, 112
 Mainardi, D., 214
 Maldonado, H., 165
 Maller, R. A., 156
 Malmo, R. B., 88
 Malzac, A., 145
 Levine, S., 122, 123, 169
 Manning, A., 15, 179
 Margoliash, E., 14
 Marler, P. R., 32, 72, 75, 90, 160, 187, 195, 207, 209, 217, 247
 Marneffe, G. de., 249
 Marsh, R., 155
 Marshall, N. B., 147
 Marten, G. C., 151
 Martin, R. C., 111
 Martinez-Vargas, C., 211
 Marzan, M., 214
 Mason, J. W., 120, 122
 Mason, W. A., 99, 217, 256–7
 Mast, M., 219
 Matthews, G. V. T., 201
 Maturana, H. R., 43–45, 49
 May, R. M., 132
 Mayer, A. D., 226
 Mayer, J., 146, 147
 Maynard Smith, J., 10–12, 194–5, 202, 207, 222–3, 225, 251
 Mayr, E., 209
 Mazuchelli-O'Flaherty, A. L., 89, 170
 Mead, A. P., 59
 Meadows, C. E., 249
 Mears, R. W., 218
 Mech, L. D., 139, 182, 190, 243, 248
 Meddis, R., 115–7
 Meerman, J., 142
 Meese, G. B., 237, 249, 253
 Meeuse, B. J. D., 33
 Meifert, D. W., 238
 Meinwald, J., 167
 Menaker, M., 100
 Menzel, E. W., 174, 181
 Mertins, J. W., 237
 Mesnil du Buisson, F. du., 41, 234
 Metcalf, R. A., 226
 Metz, H., 92
 Metz, J. H. M., 144
 Meyer, J. S., 99
 Meyer-Holzappel, M., 98
 Michael, C. R., 49
 Michael, R. P., 218, 219, 221

Miles, F. A., 55
 Milinski, M., 183
 Miller, J. G., 28
 Miller, G. D., 109, 111
 Miller, G. R., 199
 Miller, L. A., 164, 165
 Miller, N. E., 86, 87
 Miller, R. E., 123
 Milne, A., 130
 Milner, C., 151
 Milner, P. M., 49, 88, 89, 90, 103, 116, 169
 Minyard, J. P., 41, 237
 Mitchell, D. E., 54
 Mittelstaedt, H., 75–7
 Moffat, C. B., 180
 Mogenson, G. J., 145–6
 Moltz, H., 226, 231, 232
 Moody, M. F., 39
 Moore, F. R., 183
 Moreng, R. E., 112
 Morgan, B. A., 121
 Morgan, M. J., 38
 Morgan, P. B., 238
 Morgan, P. D., 236, 237
 Morris, D., 86, 98
 Morris, H. R., 121
 Morris, M. J., 105
 Morris, J. M., 247
 Moruzzi, G., 88
 Moss, H. A., 88
 Moss, R., 199
 Mountcastle, V. B., 52
 Moynihan, M., 86, 98
 Muckenhirn, N. A., 248
 Mueller, H. C., 173
 Muir, D., 54
 Mullaney, P. D., 253
 Mullard, M. M., 237
 Muller, H. J., 202
 Müller-Schwarze, D., 237
 Munn, N. L., 220
 Muntjewerff, W. S., 229
 Murphy, J. V., 123
 Murray, R. W., 29, 31
 Murton, R. K., 136–7, 180, 254
 Myers, R. D., 112
 Mylrea, P. J., 234, 249
 Myhre, K., 111, 113

Nakane, P. K., 122
 Nelson, J. B., 198
 Nelson, K., 60, 73, 92
 Newell, F. W., 53
 Nice, M. M., 196
 Nickerson, R. C., 195
 Nisbet, I. C. T., 212
 Nishida, T., 247
 Noirot, E., 112
 Norris, K. S., 244
 Norris, M. F., 228
 Notarius, C., 92
 Nottebohm, F., 72, 91, 218
 Novak, M. A., 99
 Novin, D., 107
 Noyes, J. S., 132
 Numan, M., 232

Author index

- Oades, R. D., 171
 Oates, J. F., 129
 Obara, Y., 39, 40
 O'Connor, R. J., 225
 O'Flaherty, J. J., 89, 170
 Ogawa, N., 123
 Ogura, J. H., 64
 Oldroyd, H., 42
 Olds, J. S., 88
 Olesen, J., 164, 165
 Ollason, J. C., 92
 Oomura, Y., 91
 Ooyama, H., 91
 Orians, G. H., 200, 204
 Oring, L. W., 204–5
 Osterkorn, K., 252
 Oswald, I., 117
 Otto, D., 68–9
- Packard, A., 160
 Packer, C., 189, 194, 248
 Padilla, S. C., 19
 Pain, B. F., 155
 Palka, Y. S., 222
 Palmer, J., 113
 Palmer, W. M., 236
 Panksepp, J., 144
 Parer, I. P., 260
 Parker, G. A., 205–6, 207–8, 226
 Parker, P. G., 173
 Parriss, J. R., 39
 Partridge, B. L., 179, 244–5
 Partridge, L., 129–30
 Pasquali, A., 214
 Patterson, I. J., 186, 239
 Patterson, R. L. S., 41, 235
 Pattie, F. A., 256
 Pavlov, I. P., 89
 Payne, W. J. A., 109
 Pearce, G. A., 169
 Pearson, A. J., 255
 Pearson, E. W., 169
 Pearson, K. G., 74
 Peck, C. K., 55
 Peck, F. W., 218
 Peek, H. V. S., 172
 Pelwijk, J. J. ter, 198
 Penfield, W., 117
 Perchard, R. J., 39
 Perdeck, A. C., 34
 Peterson, E. R., 74
 Peters, J. J., 117
 Pettersson, M., 181
 Pettigrew, J. D., 52
 Pfaff, D., 219, 221
 Phillips, F. M., 238
 Phillips, M. I., 107
 Phillips, R. E., 91, 171, 218
 Phoenix, C. H., 219, 221
 Pianka, E. R., 8, 12, 128
 Picton, T. W., 89
 Pinel, J. P. J., 167
 Pinniger, D. B., 120
 Pirenne, M. H., 28
 Pitcher, T. J., 179, 244–5
 Pittendrigh, C. S., 100
 Pitts, W. H., 43–5
 Poindron, P., 237
- Polan, C. P., 254
 Polley, C. R., 262
 Pomeranz, B., 44–5
 Pope, G. S., 234
 Porter, R. W., 91, 218
 Posner, M. I., 89
 Potts, G. W., 196
 Powell, G. C., 195
 Powell, G. V. N., 187
 Powers, B., 218
 Poynton, J. C., 217
 Prechtl, H. F. R., 228–9
 Pretorius, P. S., 260
 Price, D. A., 235
 Price, G. R., 11–12
 Probert, A. J., 39
 Pulliam, H. R., 128, 133, 134, 138
 Pusey, A. E., 247
 Putkonen, P. T. S., 171
 Pye, J. D., 112
 Pyke, G. H., 128, 133, 134, 138, 148–9
- Quastler, H., 96
- Radakov, D. V., 245
 Radom, S., 169
 Raivoka, E. N., 109
 Ralls, K., 196
 Ramon y Cajal, S., 43–4
 Ramsay, O., 212
 Randall, W. C., 112
 Ransom, S. W., 112
 Rasch, E., 15, 51
 Rasche, R. M., 106
 Rathkamp, R., 25
 Ratliff, F., 44–5
 Read, J. S., 238
 Redican, W. K., 247
 Reese, E. S., 196, 200
 Rehn, B., 41
 Renner, M., 100
 Reynolds, V., 121
 Rheingold, H. L., 226
 Rhijn, J. C. van., 62, 114
 Ribbands, C. R., 178
 Richard, A., 129
 Richards, M. P. M., 174
 Richards, S. M., 253–4
 Richardson, K. C., 236
 Richmond, G., 58, 59
 Richter, C. P., 139
 Riechert, S., 251
 Riesen, A. H., 15, 53
 Riffenburgh, R. H., 188
 Riggs, J. K., 113
 Ringer, R. K., 121
 Riss, W., 217
 Robb, J. M., 156
 Roberts, B. L., 55, 74
 Roberts, W. W., 91, 170, 218
 Robson, E. A., 163
 Rockwell, R. F., 209
 Rodieck, R. W., 45, 49, 50
 Rodrigues Capriles, J. M., 154
- Roeder, K. D., 29, 39, 55, 163, 217
 Roelofs, W. L., 238
 Rogers, C. M., 174
 Rogers, W., 209, 214
 Roll, D. L., 141
 Rolls, B. J., 107
 Roper, T. J., 16, 88, 111
 Rosen, J., 257
 Rosenblatt, J. S., 217, 218, 226, 228, 232–3
 Rosenblum, L. A., 231
 Ross, M. A., 253
 Rossi, P. J., 19
 Roth, H. D., 189
 Roth, L. M., 167
 Roth, R. R., 145
 Rountree, V. J., 109
 Rowell, C. H. F., 59
 Rowell, T. E., 229, 240, 249, 251, 253
 Rowland, N. E., 147
 Roy, J. H. B., 113
 Royama, T., 137, 139
 Rozin, P., 16, 137, 139
 Ruckebusch, Y., 116
 Rudran, R., 248
 Ruelle, J. E., 178
 Ruiter, L. de, 133
 Rusak, B., 21, 100
 Russek, M., 146
 Russell, E. M., 169
 Russell, G. F., 28
 Russell, I. J., 55
 Russell, J. A., 231
 Russell, W. M. S., 59, 164
 Ryan, J., 138, 149
 Rzóska, J., 141
- Sachs, B. D., 58, 59, 114
 St Paul, U. von, 91, 171
 Saladin, K. D., 130
 Saleke, I., 156
 Sales, D. I., 180, 186, 254
 Salk, L., 229
 Salzen, E. A., 171, 173
 Sambras, H. H., 235, 252
 Sanchez Riviello, M., 238
 Sand, A., 29
 Sanders, C. J., 237
 Sanders, G. D., 160
 Sandland, R. L., 153
 Sandow, J. D., 165, 166
 Sargeant, T. D., 159
 Sassenrath, E. N., 255
 Saunders, D. S., 21
 Savory, C. J., 260
 Sawyer, C. H., 91, 218, 222
 Saxon, S. V., 94
 Scanes, C. G., 218
 Schadé, J. P., 17
 Schaffner, C. S., 112
 Schake, L. M., 113
 Schaller, G. B., 17, 173, 190, 244, 249
 Scheibel, A. B., 53
 Schein, M. W., 109, 212, 252–3, 262
- Schilstra, A. J., 144
 Schjelderup-Ebbe, T., 250, 252
 Schleidt, M., 172
 Schleidt, W. M., 60, 62–3, 71, 73, 112, 173, 212
 Schloeth, R., 260
 Schmidt-Koenig, K., 201
 Schmidt-Nielsen, K., 103, 109
 Schneider, D., 28, 43
 Schneirla, T. C., 228
 Schoener, T. W., 124, 128, 140, 197
 Scholander, P. F., 108
 Schoonhoven, L. M., 142
 Schrameck, J. E., 74
 Schutz, F., 212, 214
 Schwent, V. K., 89
 Scott, D. K., 243
 Scott, J. P., 248
 Scott, P. P., 218, 221
 Scott, T. H., 249
 Seabrook, M. F., 174
 Seath, D. M., 109, 111
 Seay, B., 230
 Sebeok, T. A., 247
 Seghers, B. H., 161
 Seil, F. J., 75
 Selman, I. E., 236
 Selye, H., 120, 258
 Sevenster, P., 17
 Sewell, G. D., 112
 Shalter, M. D., 71
 Sharpe, L. G., 112
 Sharpe, R. M., 231
 Shaw, E., 244, 248
 Shaw, J. G., 228
 Shea, J. D. C., 256
 Sheard, N. M., 228
 Shepher, J., 214
 Sherk, H., 54
 Sherman, P. W., 186, 194
 Sherrington, C. S., 74
 Sherry, D. F., 112
 Shettleworth, S. J., 16
 Shillam, K. W. G., 113
 Shillito, E., 237
 Shorey, H. H., 237
 Short, R. V., 252
 Shorten, M., 141, 169
 Sibby, R., 81–4, 87, 90, 222–3
 Sidman, R. L., 59, 75
 Siegel, H. I., 226
 Siegel, P. B., 255
 Siegfried, W. R., 186
 Signoret, J. P., 41, 234–5
 Silberglied, R. E., 39
 Simonds, P. E., 211, 246
 Simpson, M. J. A., 113, 115, 215, 253
 Sjölander, S., 214
 Sjöstrom, A., 100
 Skinner, B. F., 15, 85
 Skinner, G., 39, 238
 Skutch, A. F., 190
 Slater, P. J. B., 59–60, 91–2, 100, 144, 214, 221, 232
 Slatkin, M., 131
 Slee, C., 255

Author index

- Slotnick, B. M., 232
 Sluyters, R. C. van, 53, 55
 Smith, A. A., 169
 Smith, C. C., 138, 225
 Smith, C. N., 238
 Smith, F. V., 19
 Smith, J. C., 141
 Smith, J. N. M., 131, 132, 133–4
 Smith, M., 42
 Smith, R. H., 210
 Smith, S. K., 211
 Smith, T. W., 121
 Smith, W., 252
 Smythe, N., 195
 Snow, B. K., 147
 Snow, D. W., 147, 189
 Snyder, F., 117
 Snyder, W. W., 249
 Soffié, M., 249
 Sokolov, E. N., 89, 172
 Sollberger, A., 21
 Soltysik, S., 169
 Sonnemann, P., 214
 Southwood, T. R. E., 128
 Spallanzani, L., 39
 Speckhardt, I., 43, 47
 Spence, K. W., 87
 Spencer-Booth, Y., 190, 229–30, 240
 Spieth, H. T., 189
 Spinelli, D. N., 54
 Spurway, H., 104
 Squires, V. R., 105, 249
 Sroges, R. W., 169
 Staddon, J. E. R., 92
 Stallcup, J. A., 190
 Stamm, D., 39
 Stamps, J. A., 73, 91, 226
 Stayton, D. J., 174
 Steel, E. A., 217, 219, 232–3
 Steinberg, M. L., 218
 Stellar, E., 105
 Stephan, F. K., 100
 Stephens, D. B., 122
 Stern, J. J., 231
 Stevens, L. J., 238
 Stevenson-Hinde, J., 16, 17, 241
 Stiles, F. G., 147
 Stillwell, F. P., 56–7, 62
 Stobbs, T. H., 150–155
 Stoddart, D. M., 197
 Stokes, A. W., 189
 Stokes, T. M., 91, 218
 Stokols, D., 258
 Stone, J., 45, 49
 Stricker, E. M., 146
 Strømme, S. B., 111, 113
 Struhsaker, T. T., 187, 211, 244, 246, 253
 Stryker, M. P., 54
 Sugiyama, Y., 244, 257
 Suomi, S., 214
 Surtees, G., 119
 Sweatman, H. P. A., 96, 104
 Swift, H., 15, 57
 Sylva, K., 258
 Syme, G. J., 249, 250, 251, 253, 254, 262
 Syme, L. A., 249, 254, 262
 Taggart, P., 122
 Taghert, P. H., 66–7
 Takenouchi, S., 64
 Tallarico, R. B., 118
 Tallon, S., 144
 Tamura, M., 71
 Tardif, J. G. R., 238
 Taylor, C. R., 109
 Taylor, O. R., 39
 Taylor, R. H., 186
 Teicher, M. H., 228
 Teitelbaum, H., 169
 Teitelbaum, P., 58, 146
 Terkel, J., 218, 232
 Teyler, T. J., 169
 Thibout, E., 71
 Thines, G., 249
 Thomas, G. J., 232
 Thompson, A. C., 41, 237
 Thompson, R. D., 169
 Thompson, R. F., 90, 103, 172
 Thompson, W. A., 181
 Thornhill, R., 211
 Thorpe, W. H., 15, 19, 71–3, 207
 Tinbergen, J. M., 134, 136, 161
 Tinbergen, L., 136–7
 Tinbergen, N., 32, 33–36, 62, 86, 87, 98, 185, 186, 198, 211
 Toates, F. M., 7, 93, 146
 Tobach, E., 228
 Tolhurst, B. E., 169
 Tolliver, G. A., 123
 Tolman, E. C., 85, 86
 Tolson, W. W., 123
 Tomkins, T., 235
 Toner, J. N., 122
 Tonndorf, J., 28
 Toutain, P. L., 116
 Towbin, E. J., 107
 Trammel, K., 237–8
 Traud, R. J., 165
 Traylor, D. L., 231
 Treat, A. E., 29, 39, 55, 113
 Trefney, D., 238
 Treisman, A., 89
 Treisman, M., 131, 191
 Treit, D., 167
 Trew, A. M., 228
 Trivers, R. L., 193–4, 195, 202–3, 222, 223, 225–6, 230
 Tugendhat, B., 144
 Tumlinson, J. H., 41
 Tyler, P. S., 119
 Tyler, S. J., 249
 Uexküll, J. von, 163
 Underhill, L. G., 186
 Underwood, E. J., 151
 Urban, W. E., 152, 153
 Uttal, W. R., 29, 30
 Valenstein, E. S., 217, 218
 Van Lawick, H., 17
 Van Lawick-Goodall, J., 17, 246
 Van Twyver, A., 116
 Vahreseau, W., 33
 Vehrencamp, S. L., 244
 Verner, J., 204
 Verplanck, W. S., 82
 Vertinsky, I., 181
 Vidal, J.-M., 214
 Vince, M. A., 19, 140, 169
 Watchtel, M. A., 209
 Wagner, H., 44–5
 Wagner, S. S., 124
 Waite, T. C., 255
 Wald, G., 28
 Walk, R. D., 118
 Wallis, S. J., 211, 246
 Walsler, E. S., 226
 Walther, F. R., 195
 Ward, P., 180, 192
 Wardle, C. S., 244
 Warner, G. F., 160, 179, 197, 242
 Warren, D. C., 254
 Waterhouse, A., 257, 261
 Waterman, T. H., 39
 Watson, A., 199
 Watts, C. R., 189
 Waxler, S., 147
 Webb, W. B., 116
 Webber, M. I., 135, 201
 Wecker, S. C., 129
 Weiskrantz, L., 142
 Weiss, B., 111
 Weiss, K. R., 64
 Welch, R. A. S., 237
 Welty, J. C., 124, 181
 Wendell-Smith, C. P., 53
 Werner, E. E., 135
 Westby, G. W. M., 197
 West Eberhard, M. J., 187
 Westoby, M., 124, 141, 150
 Westwood, N. J., 136, 254
 White, L. E., 230
 Whitman, C. O., 212
 Whitton, W. K., 235
 Wickler, W., 38, 161
 Wicklund, C. C., 188
 Wieckert, D. A., 260
 Wiener, E., 231
 Wiepkema, P. R., 93, 144
 Wiersma, C. A. G., 74
 Wietersheim, A. von, 41–7
 Wierzbowski, S., 236
 Wiesel, T. N., 49–53
 Wiesner, B. P., 228
 Wildey, K. B., 120
 Wiley, R. H., 189, 204
 Wilkinson, J. M., 156
 Williams, C. G., 255
 Williams, G. C., 9, 183, 203, 225
 Williams, J. D., 251
 Willows, A. O. D., 64–7
 Willson, M. F., 200–204
 Willy, S. J., 112
 Wilson, D. M., 74
 Wilson, E. O., 12–13, 187, 191, 195, 201, 202–3, 210, 242, 243, 244
 Wilson, J. A., 103
 Wilson, J. C., 231
 Wilson, L. O., 235
 Wilson, M. R., 142
 Winchester, C. F., 105
 Windfield, W. F., 74
 Winfield, C. G., 253
 Wisniewski, E. W., 249
 Wolf, L. L., 138, 147–8, 150, 197
 Wolford, J. H., 121
 Wolgin, D., 58
 Wood, D. L., 237
 Wood, M. T., 113
 Wood-Gush, D. G. M., 122, 144, 209, 260
 Woodhead, S., 141
 Woodland, D. J., 195
 Woods, A., 119
 Woods, P. J., 58
 Woodworth, R. S., 85
 Woof, R., 156
 Woollenden, G. E., 190
 Wortis, R. P., 216
 Wrangham, R. W., 247
 Wright, J. W., 105
 Wright, P., 83
 Wright, R. H., 118
 Wurtz, R. H., 55
 Wyatt, I. S., 120
 Wynne-Edwards, V. C., 9, 180, 182–3, 201, 254
 Wyrwicka, W., 91, 107
 Yamashita, K., 34
 Yarney, T. A., 236
 Yates, J. O., 113
 York, C. H., 139
 Young, B. A., 152, 153
 Young, W. C., 217
 Youngren, O. M., 41, 131
 Youngson, R. W., 252
 Yorio, T., 105
 Zach, R., 134–5
 Zack, S., 61–2
 Zahavi, A., 180, 186, 190, 192, 194, 195, 198, 244, 247, 254
 Zangger, P., 100
 Zarrow, M. X., 122, 232
 Zeigler, H. P., 147
 Zeki, S. M., 52
 Zimmermann, R. R., 169, 174, 229
 Zippelius, H. M., 112
 Zolman, J. F., 111
 Zotterman, Y., 30
 Zucker, I., 21, 100, 218

310

Subject index

- abduction of female by male, 215–6
- abnormal behaviour, 22
- Acantholyda*, 137
- accessory structure of sense organs, 24–6
- Accipiter gentilis*, 186
- Acrocephalus palustris*, 200–1
- Acrocephalus schoenobaenus*, 200
- Acrocephalus scirpaceus*, 200
- Acrolepiopsis assectella*, 132
- Acteon*, 167
- action patterns, 62–75
- action potential, 23, 24–7
- activation, 87–8
- Adalia*, 161
- adenosine triphosphate (ATP), 115
- adrenal androgen, 221
- function, 120–3, 255, 259
- hormones, 121–3, 157, 168, 219
- response, 168–9, 174–5
- response to danger, 157
- adrenalin, 3, 120–2, 157, 168
- adrenocorticotrophic hormone (ACTH), 121–3, 255, 259
- afterbirth, consumption of, 227–8
- Agelaius phoeniceus*, 200, 204
- Agelenopsis aperta*, 251
- aggregation, 185, 191, 195, 242
- at food sources, 131, 132
- behaviour, 176–9
- by distasteful animals, 161
- aggressive behaviour, development of, 256
- Aglais urticae*, 27
- agriculture, behaviour studies in, 21–2 (see Contents)
- Aileuropoda melanoleuca*, 127
- air-jet licking, 106
- Alauda arvensis*, 60, 113, 144
- alarm signals, 160, 167, 186–7, 194–5
- albumen, utilisation, 18
- allocation of resources, 7, 79–102
- allogrooming, 113, 194, 246–7
- in cattle, 113
- in primates, 113, 246–7
- altricial young, 20, 203, 223, 227
- altruism, 9, 189–91, 223
- to relatives, 192–4
- amacrine cells in eye, 50
- Amia*, 167
- amplexus, 208
- ampullae of Lorenzini, 28, 29, 31
- amygdala, 7
- and drinking, 107
- and flight behaviour, 170, 171
- Anas flavirostris*, 212
- Anas georgica*, 215
- Anas platyrhynchos*, 130, 212
- androconia, 33
- androgens, 219, 221, 233
- angiotensin, 107
- receptors in brain, 107
- Anguis*, 42
- animal husbandry
- and social behaviour, 259–62
- animal production
- and social organisation, 259–262
- and stockmanship, 174–5
- animal welfare, 260, 262
- anis, social group composition, 244
- Anolis aeneus*, 73
- Anopheles*, 119, 130
- Anser albifrons*, 184
- Anser brachyrhynchos*, 184
- Anser caerulescens*, 209
- antelopes
- defence behaviour in, 188
- detection of predators by, 187
- leks in, 189
- territory and food in, 198
- Anthonomus grandis*, 41, 237
- anti-predator behaviour, 157–75
- and social behaviour, 183
- ants
- altruism in, 193
- colony size in, 242
- defence behaviour in, 187
- driver, 41
- social group composition in, 244
- vision in, 39
- Aphelocoma ultramarina*, 190
- Aphelocoma coerulescens*, 190
- Aplysia*, 23
- aposematism, 161, 164
- Aptenodytes forsteri*, 178
- Aratus pisoni*, 197
- Archilochus alexandri*, 148
- archistriatum and vocalisation, 91
- arctic sculpin, thermoregulation in, 111
- Ardea herodias*, 131, 180, 181
- area concentrated search, 134
- Arenicola*, 158
- Argoanenia velutinana*, 238
- armadillos, anti-predator behaviour in, 163
- arms races, 126, 158
- arousal, behavioural, 88
- cortical, 88
- artefact construction, 8, 160, 178–9
- artificial insemination, 235–6
- Arum maculatum*, 41
- Ascoloptynx furciger*, 187, 188
- assessing rival, 208–9
- assortative mating, 209
- Asterias*, 130
- Ateles geoffroyi*, 129
- attention, 21, 88–9, 97, 240
- selective, 2, 89
- attention structure of social group, 240
- attentiveness, 2
- attracting potential mate, 215
- attractiveness, 219
- auditory crypsis, 160
- autistic children, 37, 100
- avoidance learning, 122–3
- axon, 23, 24
- babblers, kin helping in, 190
- social group composition in, 244, 247
- baboons, allogrooming in, 246
- controllers in social groups, 249
- diet balancing in, 14
- dispersal in, 201
- distribution in troop, 239
- food selection in, 136, 139
- group size in, 242
- leaders in social groups, 247
- mating success in, 211
- reciprocal altruism in, 189
- social development in, 257
- social group competition in, 244
- surveillance activity in, 187
- barking, 64
- baroreceptors, 107
- basal ganglia and movement, 58
- basal metabolic rate, 8
- bats, hearing in, 55
- leks in, 189
- predation by, 164, 165
- and sonar, 117, 164
- beaver, 13
- monogamy in, 204
- bee orchid, 41
- behaviour, abnormal, 22
- description of, 1
- development of, 17–21, 58–9, 72–3, 74–5, 114–5, 118, 156, 172–4, 256–8
- diversity of, 12
- genetics, 15, 59, 70–1, 75
- leading to mating, 205–17
- questions about, 1
- and sensory function, 31
- sequences of, 91
- strategies of, 11–12
- switching mechanisms in, 92
- benefit measurement, 80–2
- Betta splendens*, 17, 215
- binocular vision, 51–4
- biological priorities, 7–8, 80–2
- bird flocks, cohesion in, 245
- bite-rate during grazing, 150–1, 154, 155
- bite-size during grazing, 150–1, 154, 155
- Bittacus apicalis*, 211
- blackbirds, 33, 133–4, 180, 204
- food searching in, 133, 134
- mating systems in, 204
- nesting in, 180
- blood volume receptors, 106–7
- blowfly, sensory hair of, 30
- blue gourami, sequences of behaviour in, 95
- blue-gill sunfish, feeding in, 135
- female mimicry by male, 205
- bluetit, habit selection in, 129, 130
- boar odour, 41, 234–5
- body maintenance, 5, 103–117
- body regulation, 103–23
- body temperature regulation, 108–13
- body water level regulation, 104–8
- boll weevil, reproduction and control, 237

Subject index

- bombadier beetle, chemical defence, 167
Bombus, 134
Bombycilla cedrorum, 183
Bombyx mori, 39, 206
Bos indicus, 105
Bos taurus, 105
 bouts, 59
 of behaviour, 91–2
 of feeding, 144
Brachinus crepitans, 167
 bradycardia, 169
 brain, analgesics, 121
 anatomy, 7, 18
 biochemistry, 18
 of cricket, 69
 lesion studies, 47–8, 217–8
 recording, 46–8, 50–5, 64–7, 74, 90–1, 170, 218
 sensitivity to hormones, 221
 stimulation, 47, 64–7, 74, 91, 112, 116, 153, 170–2, 218
 of *Tritonia*, 64–7, 65, 66
Branta bernicla, 127
 breathing, 103–4
 development of, 18
 by fish, 95
 by newt, 96
 breeding colonies, 180
 breeding frequency, 203
 breeding success, 188
 brent goose, feeding in, 127
Brevicoryne brassicae, 132
 brittlestars, aggregations of, 242
 social behaviour in, 177
 suspension feeding in, 177, 179
 broken-wing display, 167
 budgerigar, drinking in, 105
 sexual development in, 217
 buffalo, defence behaviour in, 187–8
Bufo bufo, 42, 45, 206
 bumblebees, food searching in, 134
 bunting, preening in, 60
 burrowing animals, 104, 111
 owl, 104
 butterfly fish, territory in, 200
 butterflies, eyespots, 38
 feeding in, 127
 mimicry in, 161
 territorial competition in, 251
 territory in, 198
 thermoregulation in, 110
 cabbage butterfly, coloration of, 40
 vision in, 39
 cabbage rootfly, 39, 238
 caddis larvae, withdrawal response in, 163
Caenorhabditis elegans, 75
 calcium appetite, 139
Calidris alpina, 197–8
Calliphora erythrocephala, 60
Callithrix jacchus, 37, 246
 Callitrichidae, 204
Callopleksiops altivelis, 165
 calls by chicks, 18
Calypte costae, 147
 camouflage, 159–60
Canis lupus, 251
Capreolus capreolus, 196
 carbachol, 107
Carcinus maenas, 135
 cardinal, 42, 71, 110
 panting by, 110
 song of, 71
Cardinalis cardinalis, 42, 71, 110
 carnivores and herbivores, 126
Carausius morosus, 142
 carvone, taste of, 28
 castes, in aphids, 187
 in social insects, 241–2
Castor, 13
 Castoridae, 204
 caterpillars, crypsis in, 159
 warning coloration in, 161
Catocala ultronia, 159
 cats, brain of, 171
 defence responses in, 170
 maternal behaviour in, 228
 neuronal periodicity in, 100
 sensitivity of ear in, 28
 sensory motor co-ordination in, 77
 vision in, 49–55
 cattle, avoiding competition for food in, 261
 calf behaviour in, 227
 calf stealing in, 257
 calf survival in, 236–7
 competitive order and feeding in, 260
 control of food intake in, 153–4
 disturbance and competition in, 250
 drinking in, 105
 effects of crowding in, 259
 effects of isolation rearing in, 257
 energy expenditure in, 152–3
 food selection in, 151–2, 154, 154–6
 grazing in, 109, 150–6, 151
 grooming in, 113
 initiators in social groups, 249
 intake measurements in, 152
 intergroup transfer in, 262
 leaders in social groups, 248
 maternal behaviour in, 226–7
 mating 'teaser' in, 235
 maximum group size in, 262
 meal size in, 144
 metabolisable energy of food in, 152
 oestrus detection in, 234
 response to high temperature, 109, 111
 response to stress, 122
 sleep in, 116
 timing of parturition in, 236
 variability in social order, 252
 water conservation in, 105
 weaning check in, 261
 caudate nucleus, 7
 causal factor, 17, 82–5, 93–8
 causal factor space, 82–5
 cavemen, 216
 centrifugal effects on sensory function, 55
Centrocercus urophasianus, 189
 cephalopods, anti-predator behaviour in, 166
 crypsis in, 160
Cerapterix, 136
Ceratitidis capitata, 237
 cerebral cortex, and breathing, 103
 and mating control, 217–8
 and parental behaviour, 252
 and thermoregulation, 109
 and vision, 48–55, 49
Cercocebus albigena, 246
Cercocebus aterrimus, 211
Cercocebus mitis, 244
 cerebro-spinal fluid, 103
Certhia familiaris, 178
Cervus elephas, 227, 243
Chaetodon trifasciatus, 200
 chaffinch, 17
 preening in, 59
 song of, 72
 Charadriiformes, 204
 cheats and reciprocal altruism, 194
 cheetah, limit to pursuit, 109
 panting by, 109
 chemical defence in animals, 167
 children, anti-predator behaviour in, 157
 development of, 230
 response to danger in, 163
 chimpanzee, anti-predator display in, 165, 174
 greeting behaviour of, 246
 social group changes in, 247
Chironomus, 108
Chloris chloris, 181
 chromatophores, 160
Chrysopa carnea, 164
Cichlasoma citrinellum, 209
 cichlid fish, mate selection in, 209
 circadian rhythm, 100–2
Citellus leucurus, 111
 cities, 179
 cleaner fish, territory in, 196
 cleaning behaviour, 5
Clethrionomys britannicus, 90, 99
 clothes moth, repellent, 118–9
 clumped distribution, 176
 coaltit, habitat selection in, 129, 130
Coccinella septempunctata, 132
 cochlear microphonic potential, 27–8
Cochliomyia hominivorax, 237
 cod, 17
 reproductive strategy in, 221
 coding in sensory neuron, 29–31
 cold avoidance and aggregation, 78
 cold receptors, 108
 cold-stress tolerance, 18
 collaboration, in defence, 187–8
 in feeding, 181–3
 in reproductive behaviour, 189–91
 colliculi, 7
Colobus guereza, 129
 colobus monkey, feeding in, 129
 colonial animals, 191
 colonial nesting, 186
 colony defence, 186, 188
 clostrum, 236
Columba palumbus, 181
 colour vision, 52
 combat, 6
 command neuron, 64
 communal roost, 185, 186
 communication, during courtship, 215–6
 electrical, 197
 about food sources, 180
 and mate finding, 207
 olfactory, 180
 with parent, 224
 in primate groups, 246–7
 and reciprocal altruism, 194
 in social insects, 246
 about territory, 196–7
 in thrush flocks, 245
 competition, and adrenal function, 255
 and aggregation, 191, 193
 assessment of opponents, 251–2
 asymmetrical contests, 251
 for food, 183
 how to compete, 251–2
 and group size, 255, 262
 for mate, 205–9
 and mating behaviour, 235
 with offspring, 225
 between sexes, 222–3
 with social groups, 249–256
 symmetrical contests, 11–12, 251
 when to compete, 251–2
 competition between causal factors, 94, 95
 competition in social groups, 249

Subject index

- competitive encounters, measures of, 253
 competitive interaction and injury, 262
 competitive orders, 210–11, 254, 260–1
 and animal production, 260–1
 advantages of, 254
 and feeding, 254, 260
 and reproduction, 254
 components of behaviour, 56–7, 62, 63, 91
 concealment, 6, 157–60
 cones of eye, 43, 44
 conflict, intraspecific, 11
 consummatory response, 17
 controllers of social groups, 248–9
 copulation, 18, 215–221
 cornborer moth, 39
Corophium, 132, 138
 corpus callosum, 7
 corpuscle, Pacinian, 25
 Herbst, 25
 corticosterone, 255, 259
 cost benefit analysis, 4, 8–9, 11, 80–2, 128, 150, 207–9, 197–9, 225–6
 cost of changing behaviour, 84–5
 cost function, 82
 costs of competition, 251
 of feeding, 124, 138–41, 147–9, 152–3
 of fighting, 207–9
 costs,
 measurement of, 80–2
 of parental care, 225, 226
 of reproduction, 203
 of territorial defence, 198, 199
 cotton boll-weevil, 41
 cotton stainer bugs, aggregation in, 161
 coughing, 64
 courtship, 215, 221
 of butterfly, 33–4
 control of, 217
 display of ringdove, 121
 effects on hormone levels, 214–7
 feeding during, 211, 216, 233
 functions of, 214–17
 hormone effects on, 221
 by newts, 96
 as a reinforcer, 17
 sequences in fish, 92
 by stickleback, 90
 cow–calf interactions, 226, 227
 cowbird, 42
 cowman, effects on cows, 174–5
 cows (see cattle)
 crabs, concealment by, 160
 home range in, 197
 crayfish, 74
 swimming in, 74
 crickets, behaviour of mutants, 75
 singing by, 67–71, 68, 70
 cross-suckling in lions, 190
 in pigs, 190
 Crotalidae, 28
Crotophaga, 244
 crowding, 258
 effects, 258–9, 262
 crypsis, auditory, 160
 olfactory, 160
 visual, 159, 160
 cuckoldry, 224
 cuckoo, 42
Cuculus canorus, 42
 cuttlefish, motor control in, 76
 cycle, 21
Cygnus columbianus, 243
Cynomys ludovicianus, 244
Cynopithecus niger, 246
 cyproterone acetate, 218
 cytochromes, 14
 dace, behaviour when
 parasitised, 131
 reactive distance in, 132
Dacus dorsalis, 237
Dama dama, 210
Danaus plexippus, 161
 danger zone, for prey, 133
Daphne mezereum, 181
Daphnia, 135
 darkness, effects of rearing in, 15, 19
 DDT, response to, 119
 decision making, 5, 7, 8, 79–85, 89–98, 142–3
 decisions, about feeding, 125–156, 125
 whilst grazing, 150–2
 during grooming, 60
 deer, inbreeding in, 210
 controllers in social groups, 249
 leaders in social groups, 249
 social group composition in, 243
 territory in, 196
 deermice, 13
 drinking in, 105
 feeding in, 137
 habitat selection in, 129
 defaecation, 5
 before fleeing, 170
 defensive behaviour of farm animals, 174–5
 deflection of attack, 166–7
 degeneration in brain after lesions, 46, 52
 degree of relatedness, 10, 189–91, 193, 210
 deimatic displays, 165
Delia brassicae, 39, 238
 demarcation of territory, 196–7
 dendrite, 23
 depth perception, 118
 depolarisation of neuron, 23
 description, levels of, 56–7
 desert animals,
 thermoregulation in, 109
 water conservation in, 104–5
 despots, 252, 253
 deterministic models, 73, 144
 detoxification in body, 5
 detoxification mechanisms, 141
 development,
 of aggressive behaviour, 256
 of anti-predator behaviour, 172–4
 of behaviour, 17–21
 of bird song, 72–3
 of courtship behaviour, 217
 of grazing behaviour, 156
 of grooming, 58–9
 of hazard avoidance, 118
 of preening, 114–5
 of social skills, 256–8
 diabetes and control of feeding, 146
Diadema, 158
 dialects in bird song, 73
Diaretiella rapae, 132
Didelphis, 110, 165–6
 diencephalon, 7
 diet balancing and experience, 139, 141
 dietary requirements, of cattle, 152
 deficiency in, 139
 diets, 126
 digestion, 5, 144, 147, 150
 digger wasps, 33
 digging, reinforcement of, 16
Dimetrodon, 110
Diomedea immutabilis, 110
Diplostomum spathaceum, 131, 132
Dipodomys merriami, 113
 disinhibition by casual factors, 94, 95
 Disparlure, 238
 dispersal, 13, 176, 201
 displacement activities, 98
 display, action patterns in, 62
 anti predator, 164–7, 166, 167, 187, 188
 deimatic, 165
 during courtship, 212, 215, 212–16
 epideictic, 182
 frightening, 165
 of lizard, 73
 as a reinforcer, 17
 diving animals, breathing in, 104
 dog, 1
 habituation in, 171
 panting in, 109
 water balance in, 106–7
 domain of danger, 133, 183, 184, 185
 domestic chick, 17, 20
 cliff avoidance in, 118
 drinking in, 63, 105
 sequences of behaviour in, 90, 93–4
 startle response in, 169, 170
 thermoregulation in, 111, 112
 domestic fowl, competition in, 250
 feral populations of, 260
 flight behaviour, 171
 group size effects in, 258–9, 262
 meal size in, 144
 periodicity in, 100
 stereotyp in, 98
 variability in social order, 252
 dominance boundary, 84
 dominant animals, 252, 256
 Donnan equilibrium in cells, 23
Dorylus wilverthi, 242
 doves, alarm signals in, 186
 display and ovulation in, 216
 feeding and drinking in, 83–5
 hormones and courtship in, 221
 hormones and reproduction in, 232
 mate selection in, 212
 thermoregulation in, 111
 water balance in, 106
 drinking, 5, 10, 105–6
 action patterns in, 63
 dependence on eating, 105–6
 and food requirement, 83–5
 by rats, 86–7
 drives, 85–8
Drosophila, 75, 133, 179, 203
 ducks, 19
 mate selection in, 212, 214
 dung-flies, 206, 207
 competing for a mate, 207–8
 mate finding in, 205–6
 dunlin, territory in, 197, 198
 dyadic interactions, 253
 dyadic relationships, 240–1
Dysdercus, 161
 ear, of bat, 39, 55
 mammalian, 27–8
 of moth, 39, 55
 early learning, 19–20, 172–3, 224
 ecology, energetics, 4, 8
 population, 12
 economics of behaviour study, 21
 economic view of behaviour, 8
Ectopistes migratorius, 212
 ectothermy, 108
 efference copy of motor command, 75–77
 efferent neurons, 55, 89
 egg-laying, 232–3
Eichornia crassipes, 127
 electric fish, 197
 electrocardiogram, 169, 170

Subject index

- electroencephalogram, 18, 115, 116, 117, 169
 electroreceptors, 26, 28–9, 30–1
 elephant seal, mate selection in, 210, 211
 elephants, drinking in, 105
Emberiza, 60
 embryos, behaviour of, 18–19, 74
 electrophysiology of, 18
Empidonax minimus, 197
Encarsia formosa, 120
 endothermy, 108
 energy, allocation of, 8
 estimation of, 8–9
 from food, 146, 147–9, 152–3
 and mate finding, 205
 and nutrients, 138
 sources of, 2
 environment, effects on behaviour, 13–21
 effects on habitat selection, 129–30
 effects on social behaviour, 256–8
 modification of, 178–9
 modification by aggregation, 178
 enzyme synthesis, 14
Ephestia caustella, 132, 238
 epideictic displays, 182
 epinephrine, 120
Erinnyis ello, 159
Erythrocephalus patas, 197
 ethology, 4, 22
Etophpus maculatus, 62
Eucalyptus, 127
Eugenes fulgens, 148
Eulampis jugularis, 147
Eumenes semele, 33
Euphagus cyanocephalus, 180, 186
 evading predator attack, 163, 164, 165
 evolution, of defence mechanisms, 157–8
 of motivation, 8
 of parental care, 223
 of receptors, 23
 of reproductive behaviour, 202–5
 of social behaviour, 191–5, 192
 evolutionary stable strategy (ESS), 10–12, 190
 in competition for mate, 207–9, 223, 226, 250–1
 exafference, 75–7
 experience, types of, 3
 experience effects, 15–17
 on bird song, 72–3
 on collision avoidance, 168
 on competitive behaviour, 251
 on courtship, 212, 217
 on dietary preferences, 141–2, 143
 on feeding, 16, 43
 on food searching, 134, 135
 on grazing behaviour, 156
 on habitat selection, 129, 130
 on locomotion, 74–5
 on mate selection, 212–4
 on mating behaviour, 217, 235–6
 on motor control, 77–8
 on parental behaviour, 230–1
 on pecking preferences, 20
 on predator avoidance, 158, 172–4
 on reproductive behaviour, 212–4, 217, 230–1, 235–6
 on social behaviour, 256–8
 on song of crickets, 70
 on visual analysers, 15, 48, 53–5
 exploration, 168–9
 eye to eye contact, 240
 eyes, in anti-predator displays, 165–6
 of frog, 43–46
 of horseshoe crab, 44–5
 mimics of, 38
 recognition of, 37–8
 sensitivity of, 28
 transduction in, 28
 faces, recognition of, 35–8, 36
Falco peregrinus, 185
 falcons, response to prey flock, 185
 fanning by honeybees, 178
 farm animals, mating behaviour in, 234–5
 oestrus detection in, 234, 235
 parental behaviour of, 236–7
 promoting reproductive success in, 233
 responses to man, 174–5
 fatigue, 115
 fear, 168
 feedback, during locomotion, 74–5
 negative, 5, 21
 positive, 5, 97–8
 and temperature regulation, 108, 109
 feed forward, 145, 149
 and temperature regulation, 108, 109
 feeding, 5, 124–156
 by cattle, 150
 decisions about, 124
 by dogs, 138
 by domestic chicks, 93–4
 effects of experience on, 16, 143
 by hummingbirds, 147
 and water requirement, 83–5
 feigning death, 165–6, 167
 feral animals, 197, 260
 fibre tracts in the brain, 16–18, 22
 finches, imitative behaviours in, 181
 fighting for a mate, 207–9
 firefly, mate finding in, 206
 motor control in, 76
 fish, cohesion in shoals, 244–5
 courtship displays in, 92
 feeding in, 135
 mate selection in, 214
 territory in, 196, 200
 fistula, 106
 fitness, 9–10
 fixed action pattern, 62–3
 flatworm, host-finding, 130
 flies, grooming in, 60–1
 leks in, 189
 flight distance, 163
 flight from predator, 163–4
 flock feeding, 182
 flock integration after mixing, 261
 flock size and response to predators, 186–7
 flocking, 185, 194–5, 245
 flour moth, reproduction and control, 237
 followers, young ungulates, 227
 food, finding, 128–38
 finding and social behaviour, 179–81
 information centres, 180–1
 intake control, 143, 147
 processing time, 150
 storage, 144–5, 149
 foraging, 124, 131–40, 150–2
 fore-brain, 7
 and thermoregulation, 111
 formation flying, 178–9
Formica rufa, 187
 fostering, 213–4, 237
 foxes, territorial competition in, 251
 freezing and survival, 108
Fringilla coelebs, 16, 59
 frog, 23
 vision in, 43–6
 fruitfly, behaviour of mutants, 75
 reproduction and control of, 237–8
 functional response to food density, 136–7
 functional systems, 4–6, 8, 20, 103, 202
 γ -amino butyric acid (GABA), 18
Callinago gallinago, 163
Gallus gallus, 212, 256
 gamete size, 202
Gammarus, 130, 133
Garrulus glandifarius, 127
Gasterosteus aculeatus, 132, 209
 Gastropoda, chemical defence in, 167
Gazella thomsoni, 195
 geese, following response in, 19
 mate selection in, 209
 parental recognition in, 172–3
 predator recognition in, 173
 social group composition, 243
 vigilance in, 184
 gene expression, 8, 13–15, 14
 gene sharing by relatives, 10
 gene spreading in population, 9, 32, 79–81, 120, 127, 141, 165, 180, 183–4, 191, 193, 199, 204, 223
 general drive, 87
 generalist feeders, 126–7
 generator potential, 24–6
 genetics and environment, interaction of, 2, 3, 10, 13–15, 14
 genotype, 8
 Geometridae, mimicry in, 160
 gerbils, parental behaviour in, 227–8, 231
 pup behaviour in, 228
 ultrasonic calling in, 112
Gesonula punctifrons, 127
 gestalt, 32
 giant panda, feeding in, 127
 gibbons, group size in, 243
 monogamy in, 204
 territory in, 197
 gila monster, coloration of, 161
 giving-up time, 138, 149
Glossina palpalis, 205
 glucocorticoids, 168
 glucose level in blood, 146, 153
 glutamic acid decarboxylase (CAD), 18
 goats, development of, 20
 oestrus detection in, 235
 water balance, 107
 goldfish, 42
 gonadotrophins, 231–3
Goniopsis cruentata, 197
 gorillas, controllers in social groups, 249
 leaders in social groups, 249
 social interactions of, 249–50
 grain beetles, responses to insecticides, 119
 Grandlure, 237
 granule cells, 57
 grasshoppers evading predators, 164
 grayling butterfly, 33, 35
 grazing, 150–156, 151
 great tit, feeding in, 135
 food selection in, 139
 territory in, 199
 greeting behaviour of chimpanzees, 246
 grooming, 5, 113

Subject index

315

- anti-predator functions of, 160
 by cattle, 113
 by dog, 1
 by flies, 60–1
 by kangaroo-rats, 113
 by mice, 56–9, 56
 by rats, 58, 59
 by mantids, 61, 62
 by mutants, 59
 reinforcement of, 16
 ground squirrels, alarm signals in, 194
 thermoregulation in, 111
 vision in, 49
 group defence of food, 183
 group living, advantages of, 178–96
 disadvantages of, 183, 188
 and feeding, 191–2, 194
 and mate finding, 188–9
 and predator avoidance, 191–4
 group selection, 9–10
 group territories, 197
 grouse, leks in, 189
 territory in, 199
Gryllus armatus, 71
Gryllus campestris, 67, 68
Gryllus rubens, 71
 guillemots, nest departure by, 162
 guinea-pigs, parental behaviour in, 231
 gular fluttering, 109
 gulls, decisions when nesting, 79
 individual distance in, 195
 parental recognition in, 34–6, 35, 36
 preening in, 114
 guppies, schooling in, 162
 gut receptors, 153
Gymnothorax meleagris, 165
 gymnotid fish, electroreceptors in, 30
 gypsy moth, reproduction and control, 237–8
 habit strength, 85
 habitat, 128
 habitat quality and mating system, 204
 habitat selection, 125, 129–31
 and crypsis, 159
 and defence, 158–9
 habituation, 16, 172
 of prey catching, 48
Haematopus ostralegus, 139
Haminoea, 167
 Hamiltonian function, 82
 hamster, 16
 hand-rearing, effects of, 212
 handling effects on young rodents, 168–9, 174
 handling time of food, 137
 hang-fly, courtship feeding in, 211
 haplodiploidy, 191, 193–4
 harems, 210–11, 260
 hatching synchronisation of, 18–19
 hawks, prey catching by, 186
 hazard avoidance, 5–6, 80, 103, 117–120, 140, 142–3
 hearing, ultra-sound, 39
Heloderma, 161
 helpers at the nest, 190
Hemichromis bimaculatus, 37
Hemilepistus, 104
 hepatic glucoammonium receptors, 146
 herbivores and carnivores, 126
 Herbst corpuscle, 25
 herd behaviour, 185
 herons, colonial breeding by, 180
 finding feeding sites, 131
 food finding, 180, 181
 herring gull, 34, 35
 decisions when nesting, 79
 preening in, 114
 hibernation, 108
 hidlers, young ungulates, 227
 hiding in holes, 158–9
 hiding amongst conspecifics, 162, 183–6, 184
 hiding place, 8
 hind-brain and breathing, 103
 hippocampus, 7, 171
 and exploration, 169
Hippocrepis comosa, 129
Hirundo rustica, 195
 hoarding of food, 127
 home, 8
 home range, 195
 homeostasis, 4, 86
 homing, to nest site, 206
 honeybees, communication in, 180
 food-finding in, 180
 vision in, 39
 hormone assays, 218
 hormone levels, effects of courtship on, 216–7
 hormones, and behaviour, 3, 218 (see names of hormones)
 central effects on behaviour, 219, 221
 effect on parental behaviour, 231–3
 inhibitors, 218
 implants in brain, 218, 221
 peripheral effects on behaviour, 219
 and sensory input, 219
 horses, leaders in social groups, 249
 oestrus detection in, 235
 response to flies, 240
 sleep in, 116
 horseshoe crab, eye of, 44–5
 housefly, reproduction and control in, 238
 response to insecticide, 219
 house sparrow, rhythms in, 100
 howler monkey, food selection in, 138
 huddling, 178
 humans, 20
 anti-predator behaviour in, 157
 courtship in, 215
 decision making by, 80, 92
 early preferences in, 228–9
 essential amino acids in, 139
 experience and exploration in, 174
 eye exaggerators in, 37
 individual distance in, 195
 leaders and controllers, 248
 learning by babies, 104
 light sensitivity range in, 30
 mate selection in, 214
 maternal behaviour in, 230
 menstrual cycle in, 219
 motor development in, 75
 neonate behaviour in, 228–9
 nipple finding in, 228
 poison avoidance in, 141–2
 reciprocal altruism in, 194
 response to stress, 122
 response to boar odour, 235
 rhythms in, 101, 102
 role development in, 257
 sensitivity of eye in, 28
 sensory-motor co-ordination in, 77
 smiling by babies, 229, 230
 sound range of ear in, 30
 startle response in, 169
 stereotypies in, 98–100
 villages and cities, 179
 visual preferences of babies, 36, 37
 humming birds, adaptations for feeding, 147–8
 energy from food, 47
 feeding in, 147–50
 feeding control system in, 149
 foraging behaviour in, 148
 leks in, 189
 meal size in, 148
 and pollination, 147
 hunting, behaviour of owls, 133
 effects of practice on, 258
 in groups, 182
 hunting dog, 17
 stereotypy in, 99
 hyaenas, 17, 188
Hylobates lar, 197
 Hylobatinae, 204
 hypophysis and parental behaviour, 232
 hypothalamus and control of feeding, 146–7, 153
 and defence behaviour, 170–1
 and mating control, 217–8, 221–2
 and motivation, 91
 and parental behaviour, 232
 and thermoregulation, 112
 hypovolaemia, 107
 hysteria in poultry, 174–5
 imitative behaviour, 181
 immobility, and predator avoidance, 162
 as a response, 171
 immunogloblins, 236
 imprinting, 19, 224
 inbreeding, 210
 incest, 210
 inclusive fitness, 9–10, 193, 223
 incubation behaviour, 79, 233
 by males, 204
 indifference function, 80, 81
 individual distance, 185, 195–6, 256, 258
 and courtship, 216
 infanticide, 190, 225
 information processing, 2, 96
 initiators in social groups, 248, 268–9
 insect, control of walking, 74
 repellents, 118–9
 sensitivity of eye, 74
 insecticide, effects on behaviour, 119–20
 responses to, 142
 instinct, 85
 insulin and control of feeding, 146
 interactions, competitive, 12
 dog and bitch, 1
 in social groups, 240–1
 interspecific territory defence, 200–1
 intervening variables, 86, 87
 isolation rearing, and courtship, 217
 effects of, 72–3, 212, 231, 256–7
Ixodes ricinus, 30
 jacanas, polyandry in, 204–5
 jays, kin-helping in, 190
 jewel fish, response to eyes, 37
 John Dory, anti-predator behaviour in, 166
 Joule, a measure of energy, 8
 jungle fowl, courtship development in, 217
 development of fighting in, 256
 mate selection in, 212
Jynx torquilla, 165
 K-selection, 12–13
 kangaroo rat, grooming in, 113
 kin, selection, 10
 helping, 189–91
 koala, feeding in, 127
Kobus kob, 189
 lacewings, evading predators, 163, 164, 165
 ladybird beetle, coloration of, 161
Lagopus mutus, 163

Subject index

- Lampornis clemenciae*, 148
 land crab, drinking in, 105
Lantus, 105
 langur, 37
Larus argentatus, 34, 35, 79, 114
Larus atricilla, 34
Larus ridibundus, 186, 195
 lateral geniculate nuclei of thalamus and vision, 48–55, 49
 lateral inhibition in eye, 44, 45, 46, 50
 lateral line sense of fish, 55
 laughing gull, 34
 leaders of social groups, 181, 248–9
 leaf mimicry, 160
 leaf roller moth, reproduction and control, 237–8
 learning, 3, 15–17
 about anti-predator behaviour, 172–4
 characteristics of young, 237
 about competitive behaviour, 251
 effects on social order, 252
 about environment, 173
 during exploration, 168, 173
 by farmers, 155
 about feeding methods, 181
 about food, 141–2, 148, 190
 parental characteristics, 214, 223–4
 from parents and peers, 257–8
 sibling characteristics, 214
 and thermoregulation, 111–12
 leather jacket, 134, 136
Leiocephalus carinatus, 253
 leks, 189, 195, 198, 205, 206
 lemmings, 13
 crowding and migration in, 259
Lemmus lemmus, 259
Lemur catta, 201, 246
 lemurs, 13
 response to eyes, 37
 territory in, 201
Leontotis, 197
Lepomis macrochirus, 135, 205
Leuciscus leuciscus, 132, 133
 light, polarised, 39
 receptors, 26, 28
 ultra-violet, 39
 light-flashing, and mate finding, 206
 linear social order, 252–3
 lions, 17
 dispersal in, 201
 reciprocal altruism in, 190
Limenitis archippus, 161
 limpet, active defence behaviour in, 167
Limulus, 44
 litter-size, 228
 lizards, feigning death, 167
 social order in, 253
 thermoregulation in, 110–11
Lobotes surinamensis, 160
 local enhancement, 181
 locomotion, control of, 74–5
 development of, 74–5
 locus coeruleus and sleep, 116–117
 locust, feeding in, 127
 feeding by swarm, 182
 poison avoidance by, 141
Locusta migratoria, 141
 log-survivor function, 60
Loligo, 23
Lonchura striata, 212
 luteinising hormone (L.H.), 231–2
 luteinising hormone releasing factor, 221
Macaca fuscata, 142
Macaca mulatta, 211
Macaca radiata, 211, 246
Macaca silenus, 246
Macaca sylvanus, 253
 macaques, allogrooming in, 246
 feeding in, 142
 mating success in, 211
 oestrus cycle and behaviour, 221
 parent offspring interactions, 229, 230, 229–31
 responses to stress, 122, 123
 social development in, 257
 social group changes in, 247–8
 stereotypy in, 98–9
Macropus parryi, 244
Macrotermes natalensis, 178, 179
 magnetic field, detection of, 26
 maintenance of body, 103
 of body surface, 113
 malathion, responses to, 119, 120
 male dispersal in monkeys, 247, 248
 mammals,
 mating systems in, 204
 visual system in, 48–55
 man – see humans
Manduca sexta, 142
 mangabeys, allogrooming in, 246
 mating success in, 211
 mantis, grooming in, 61–2
 motor control in, 76, 77
 prey catching in, 76
 marginal value theorem, 138, 149, 207–8
 marine animals, osmoregulation in, 104
 Markov chain, 71, 92, 160
 process, 72, 92
 marmosets, allogrooming in, 246–7
 monogamy in, 204
 paternal behaviour in, 229
 response to eyes, 37
 social group composition, 243
 marsupials, response to novelty in, 169
 maternal deprivation, 230
 maternal locking, 227, 228
 maternal rejection of young, 237
 mate, competition for, 205–9
 mate desertion, 222–3
 mate finding, 205–7
 and group living, 188–9
 and social behaviour, 188
 mate quality, 202–3, 210–12, 215
 selection, 189, 202–3, 209–14
 mating, behaviour leading to, 205–17
 whilst being eaten, 216, 217
 mating systems, 202, 203–5
 control of, 217
 maze learning, 17
 meals, intervals between, 144
 meal size, 144
 mechanoreceptor, 25–8, 30
 medical practitioners as observers, 22
 medulla, 7
 and breathing, 103
 and movement, 64
 and vocalisation, 91
Megaprotodon strigangulus, 200
Melanerpes formicivorus, 127
Melanolophia canadaria, 159
Meleagris gallopavo, 189
Melospittacus, 105
 memory, of food sites, 134
 of nest sites, 206
 menopause, evolution of, 225
Mephitis, 161
Meriones unguiculatus, 112
Merops bulocki, 190
 metabolic rate, change in, 109
 metabolisable energy of food, 152
 methyl eugenol, 237
 micro-electrodes, 46, 49, 68
Microcebus murinus, 37
Microtus, 259
Microtus agrestis, 90, 99, 100
Micrurus, 161
 mid-brain, 1
 and defence behaviour, 170
 and flight behaviour, 171
 and thermoregulation, 112
 and vocalisation, 91
 migrating flocks, 245
 migration, 201
 and food scarcity, 182–3
 milk ejection, 174, 228
 milk let-down, 174, 228
 milk production and drinking, 106
 mimicry, 6
 of female by male, 205
 of inedible objects, 160
 of injury, 167
 Müllerian, 161
 of predators, 165
Mirounga angustirostris, 210, 211
 mite, 140
 mobbing, 162, 188
 modal action pattern, 63
Molothrus ater, 42
 monogamy, 203–5, 226, 243
 monkeys, alarm signals in, 187
 allogrooming in, 246–7
 anti-predator displays in, 165
 effects of isolation rearing, 256–7
 feeding in, 129
 leaders in social groups, 248
 maternal care, 225
 mating success, 211
 oestrus cycle and behaviour, 221
 parent-offspring interactions, 228–31, 229, 230
 response to novelty, 174
 social orders in, 253
 startle responses in, 169
 territory in, 197
 vision in, 49–51, 55
 monophagy, 127, 128, 139
 Moro reflex, 228
 morphine, mimics in the brain, 121
 mosquito, host finding, 130, 179
 repellents, 118
 response to insecticide, 119
Motacilla alba, 188, 198
 moths, anti-predator display in, 165
 crypsis in, 159
 evading predators, 163–4
 hearing in, 29, 55
 mimicry in, 161
 motivation, 79–102
 evolution of, 79–82
 and motor control, 58
 terminology, 85–9
 motivational dominance, 95–6
 motivational state, 83, 87, 89–91, 99–100, 124
 motoneuron, 74, 75
 motor ability, 2
 control, 56–78
 centres, 63–64
 cortex, 57–8
 moulting in insects, 3
 moulting behaviour, 234–5
 movement, 7
 control of, 56
Mugil cephalus, 195
 Müllerian mimicry, 161
 multiparous parents, 227, 230–31

Subject index

317

- multiple clutch polygamy, 204–5
Musca domestica, 119
 muscle spindle, 25, 26, 27
Mus musculus, 259
 mustard oil, 39
 mutants, grooming in, 59
Mygalopsis ferruginea, 165, 166
Myox ocephalus, 111

Nauphoeta cinerea, 211
Nectarinia reichenowii, 197
 needs, 85
 nematodes, behaviour of mutants, 75
Nereis, 135, 138, 158, 172
 nest-building, 111, 179, 231, 233
 by rat, 111
 nest-sanitation, 160
 nesting colonially, 186
 nesting material, and ovulation, 216
 nestling, gaping response of, 32, 33, 34
 nests and parental behaviour, 224
 neuron, 23
 neurosecretion, 218
 newt, breathing in, 104
 courtship in, 96
Nicotiana tabacum, 142
 nightjars, thermoregulation in, 109–10
 nocturnal living, 109
 noradrenalin, 121–3
 novel food, responses to, 141–2
 novelty, responses to, 168–9, 173–4
 nutrient quality of food, 135–6
 nursing, 236
 nutrient, selection of, 150
 nutrient quality, 135–6, 138–9
Nymphalis io, 38

 obesity, 147
Octopus, vision in, 39, 166
Odocoileus hemionus, 209
 odours and predation, 160
 oestrogens, 219, 221, 231–3
 oestrus behaviour, in dogs, 3
 in farm animals, 41, 234, 235
 in primates, 219–21, 220
 in rodents, 219, 220
 oestrus detection in farm animals, 234–5
 oestrus synchronisation, 235
 offspring, numbers of, 203
 oilbirds and sonar, 117
 oiling feathers, 114–5
 olfactory crypsis, 160
 olfactory receptors, 26, 28
 oligaphagy, 127, 142
 ommatidia, 44, 45, 46
 open loop control of movement, 76–7

 operant, 17
 operant conditioning, 17, 111, 113, 139–40, 219
Ophiothrix fragilis, 177, 242
Ophrys apifera, 41
 opossum, feigning death, 165–6
 thermoregulation, 110
 optic lobe, 18
 optic nerve, 43, 49
 optic tectum and vision, 46–8, 49
 optimal foraging, 8, 128, 135, 140, 148–50
 optimality, 8–9, 81–2
 and feeding, 128
 oral receptors, 106–7
 organisation of social groups, 239–62
 orientation reactions, 89, 169
 orientation and thermoregulation, 110
 origins of group living, 191–3, 192
Oryzaephilus surinamensis, 119
 osmolarity of blood, 107
 osmoreceptors, in brain, 107
 in skin, 105
 osmoregulation, 5, 17, 104–5
Ostrinia nubilalis, 39
Otis tarda, 127
 outbreeding, 210
 ovenbird, food searching in, 134, 135
 over-crowding, 258, 262
 overdispersal in distribution, 176
 overload, 120–3
Ovis canadensis, 251
 ovulation, initiation of, 216, 217, 232–3
 owlfly larvae, defence behaviour of, 187, 188
 oxygen, consumption and energy, 147, 152–3
 how to obtain it, 5, 103–4
 oyster-catcher, feeding methods, 139

 pacemakers, 21, 100
 Pacinian corpuscle, 25
 pain, 120–1
 pain receptors, 26–7
 panting, 109
Papilio xuthus, 34
Papio anubis, 189
Papio cynocephalus, 138, 187, 211, 243, 246, 253
Papio hamadryas, 215, 244
 parabiosis, 218
Paralithodes camtschatica, 195
Pararge aegeria, 198
 parasites, host finding by, 130–1
 modifying host behaviour, 130–3

Parastagmoptera unipunctatus, 76
 parental behaviour, 9, 13, 17, 190–3, 221–3
 and crowding, 259
 by guillemots, 162
 and thermoregulation, 112
 parental investment, 202–3, 221
 parental recognition, 172–3, 223–4
 parent-offspring conflict, 225, 226
 parent-offspring interactions, 202–3, 222–3
 parents, requirements of, 224–5
 parity, 227, 230–1
 parturition, 226, 227, 236
Parus, 181
Parus ater, 129
Parus caeruleus, 129
Parus major, 132, 137, 181
 passenger pigeon, mate selection in, 212
Passer domesticus, 100
 patches in food distribution, 125, 128–9
 patch-finding, 131, 148
Patella granatina, 167
Patella oculus, 167
 paternal behaviour, 228, 229
 pattern detection, development of, 15
 pattern recognition, in mammal vision, 48–55
 in toad vision, 42–3, 45–8
 patterning in behaviour, 56–78
Peccari angulatus, 244
 pecking accuracy, development of, 18–19
 pecking by domestic chicks, 91–2
 pecking preferences, 20
 of gull chicks, 34–5, 36
Pecten, 163
Pelecanus onocrotalus, 182
 pelicans, group fishing, 182
 penguins, huddling in, 178
 preening in, 114–5
 perception, 76–8, 224
 period, 21
 periodic actions, 92, 100–2
 periodic processes, 3, 21
 periodicity, 21, 100–2
Peromyscus, 13, 105, 129, 137
 pest control, 237–8
 pests, behaviour of, 22
Phaethornis longuemareus, 189
Phalaenoptilus nuttalli, 110
Phascolarctos cinereus, 127
 phasic responses from receptors, 31
 pheromones, 206, 219, 237–8
Philanthus, 33
Philesturnus carunculatus, 73
Philomachus pugnax, 204

Phoenicoperus ruber, 195
Phrynosoma, 110
 physiology, links with ethology and psychology, 4
 Pieridae, 127
Pieris rapae, 39, 40
 pigeons, alarm signals in, 186–7
 drinking in, 105
 evading predators, 163
 imitative behaviour in, 181
 recognition of human faces, 38
 pigs, cross-suckling in, 190
 effects of crowding in, 262
 initiators in social groups, 249
 mating 'teaser', 235
 odour of boar, 41
 oestrus behaviour in, 41, 234–5
 sleep in, 116
 teat order in, 253
 thermoregulation in, 111
 variability in social order, 252
 piloerection, 109
 pineal gland, 7
 pituitary gland, 7
 plant defences, 140, 141
 plasticity of behaviour, 15
 play, 257–8
 playing 'possum', 165–6, 167
 Ploceinae, 203
Ploceus cucullatus, 209
Ploceus nigerrimus, 162
Poephila castanotis, 59, 100, 144, 212
 poisons, 140–2
 avoidance of, 16
 responses by rats to, 22
 polarized light, sensitivity to, 9
Pollachius virens, 245
 pollination, 41
 polyandry, 203–5
 polygamy, 203–5, 222
 polygyny, 203–5, 209
Polymorphus paradoxus, 130
 polyphagy, 127, 128, 139
Pomacea, 127
 pons, 7
 poor-will, thermoregulation in, 110
 population density, and behaviour, 259
 and territory, 199
 population ecology, 12–13
 population regulation, 9
Porcellio scaber, 104
 porcupine, anti-predator behaviour in, 162
Porhethria dispar, 237
 position and predator avoidance, 162
 post-natal behaviour, 226–9
 posture and thermoregulation, 110
 potential, action, 23, 24–7

Subject index

- potential action (*cont.*)
 generator, 24–6, 24, 26
 receptor, 24–5, 24
- precocial young of animals, 20, 173, 223
- predators, avoidance of, 6, 8, 17
 defence against, 157
 defence after detection, 162
 defence before detection, 158
 finding prey aggregations, 188
- predispositions to learn, 15
 preening, 5, 59–60, 113–15
 by domestic chicks, 93–4
 by herring gull, 114
 by penguins, 114–15
 by skylarks, 114
 by terns, 98, 113
- preoptic area, and drinking, 107
 and mating control, 217–18, 221
 and parental behaviour, 232
 and thermoregulation, 113
- Presbytis*, 211
- pretectal area and vision, 46–8, 49
- prey catching, by mantis, 76
- primary defence mechanisms, 157
- primate groups, cohesion in, 245–7
- primates, parental behaviour in, 228–30, 229, 230
- primiparous parents, 230–1
Procambarus clarkii, 74
- proceptivity, 219
- progesterone, 221, 231–3
- prolactin, 232–3
- Propithecus verreauxi*, 201
- proprioceptors, 76
- protean behaviour, 164
- Psychidae, 163
- psychology, cognitive, 22
 introspective, 32
 links with ethology and physiology, 4
 physiological, 7
 role of motivation studies in, 78
 social, 22
- Pteroclididae, 105
- Pteroptyx*, 206
- Purkinje cells, 57–9
- Pygocelis adeliae*, 114, 186
- pyramidal cells, 57–8
- python, strike by, 62
- quartering fields, by owls, 33
- quail, mate selection in, 214
- Quelea*, 180, 187
- r max-selection, 12–13
- rabbits, hormones and mating in, 221
 vision in, 49, 52–3, 55
- ragworm, habituation in, 171
- sensitisation in, 171
- Rana*, 23
- random distribution, 176
- Raphé nucleus, and sleep, 116
- rats, 16, 26
- active defence behaviour in, 167
 cliff avoidance by, 118
 effects of crowding in, 259
 essential amino acids in, 139
 exploration in, 168–9
 feeding strategy in, 144–5
 grooming in, 58, 59
 hormones and mating, 221
 meal size in, 144
 nest building in, 111
 oestrus cycle and behaviour in, 220
 responses to novelty, 168–9
 responses to stress in, 122
 responses to poisons, 141
 thermoregulation in, 111, 112
 vision in, 50–2
 water balance in, 106
- rational decisions, 80
- rattlesnake, 28
- reactive distance, in dace, 132
 in stickleback, 132, 133
- reaffERENCE, 75–8
- rearing conditions, effects of, 15
 and mate selection, 212–14
- receptivity, 220, 221
- receptor function, principles of, 23
- receptor potential, 24–5, 24
- receptors, cold, 108
 electric, 26, 28–9, 30–1
 in fat depot, 154
 in gut, 153
 mechano, 25–8, 30
 olfactory, 26, 28
 pain, 26–7
 sensitivity of, 28, 29
 specificity of, 27, 29
 temperature in, 26, 28
 transduction in, 27–9
 warm, 108
- recognition of parents, 223–4
- recognition of young, 224, 227, 237
- redshank, feeding in, 135, 138
- food selection in, 138
- reef fish, territory in, 196, 200
- regulation, 107
 of body temperature, 108–13
 of body water level, 104–108
 of feeding behaviour, 144–7, 146
- reinforcers, 16–17, 85, 88, 111
- relationships, 22, 241
 complex, 241
 development of, 257
- releaser, 32–8
- REM sleep, 116–17
- renewal process, 73–4
- replicator selection, 193
- reproductive potential, 202–238
 effort in, 202
 isolation in, 209
 and pest control, 237–8
- response to change, development of, 18
- responses to parents, 18, 19
- rest, 115
- resting discharge, 31
- resting potential, 23
- resting sites and crypsis, 159
- retaliation when attacked, 167
- reticular formation, 7
- retina, biochemistry of, 18
 of frog, 44
 ganglionic cells in, 43–6, 44, 48–55, 51
- retinal, 28
- retinal functioning in amphibians, 43–6
 in birds, 55
- rhesus monkey (see macaques)
- rhinoceros, defence in, 158
- rhodopsin, 28
- rhythms and predator avoidance, 161–2
- risk, to alarm caller, 195
 avoidance, 80–1, 180, 209
 of competition, 250
 and feeding strategy, 144
 situations, 122
 whilst feeding, 140–2
- Riparia riparia*, 186
- Rissa tridactyla*, 186
- ritualised fighting, 251
- rodents, parental behaviour in, 227–8, 231
- rods of eye, 43, 44
- rooks, distribution in flock, 239
- roosting communally, 180, 182
- Rostramus sociabilis*, 127
- rotational grazing, 154
- ruminants, feeding in, 150–6
- rutting by deer, 210
- saddleback song, 73
- Saguinus mystax*, 247
- saithe, schooling in, 245
- saliva spreading, 110
- sandbathing, 113
- sandgrouse, drinking in, 105, 180
- Saturnoidea, 138
- scallops, swimming in, 163
- scanning for food, 131
- Scathophaga stercoraria*, 205
- Sceloporus occidentalis*, 167
- scent marking, 16, 196–7, 251
- Schistocerca gregaria*, 127
- schooling by fish, 162, 178–9, 244, 245
- screw-worm, reproduction and control, 237
- Scrobicularia plana*, 138
- sea anemones, swimming in, 163
- searching behaviour, 128–38, 205–5, 208
- search paths, 133, 134
- seasonal effects of hormones, 221
- secondary defence mechanisms, 158
- secondary plant compounds, 141, 152
- Seiurus aurocapillus*, 134, 135
- selective attention, 2, 89
- self-advertisement, 206
- self-stimulation, 88
- sensitisation, 172
- sensitivity of receptors, 28, 29
- sensory analysis, 33
 behavioural avoidance for, 35
 and predator avoidance, 173
- sensory deception, 39–42
- sensory development, 17–18
- sensory feedback and movement, 58–9
- sensory mechanisms, 2, 23
 and hormone levels, 219
 range of types, 26–7
- sensory-motor co-ordination, 18, 75–8
- sensory neuron, coding in, 29–31
- Sepia*, 166
- septal area, 7, 171, 232
- sequences of behaviour, 57, 60–2, 83–5, 90–101
 during grooming, 57, 60–2
- serotonin
 and sleep, 116
 and thermoregulation, 112
- Setaria*, 154
- set-stocking of grazing animals, 154
- sex attraction pheromones, 237–8
- sex ratios, 223, 225
- sexual reproduction
 advantages of, 202
 consequences, 202–3
- sharks, feeding in, 183
 food finding in, 130
- shearwaters, pre-migratory flocks of, 242
- sheep, drinking in, 105
 ewe:ram ratios of, 235
 experience and mating behaviour in, 236
 feral populations of, 260
 flock mixing in, 261, 262
 food selection in, 151
 home range in, 197
 lamb fostering, recognition and stealing in, 237
 leaders in social groups of, 248
 oestrus detection in, 151
- sheep tick, host finding by, 130
- shoals of fish, 178–9
- shock avoidance, 15
- shrew feeding in, 137
- shrikes, 104–5

Subject index

- siamang, food selection in, 136
 sign stimulus, 32–8
 silk moth, mate finding in, 206
 olfactory receptors in, 28, 38
 olfactory sensitivity in, 28
 singing, by birds, 71–73
 by crickets, 63–71, 68, 70
 by hybrid crickets, 70–1
 single frame analysis of cine film, 61
Sitophilus granarius, 119
 skate, electrical sensitivity in, 28
 skills, social, 256
 skunks, anti-predator display in, 164, 166
 coloration of, 161
 skylarks, preening in, 60, 113, 114
 sleep, 18, 115–7
 electroencephalogram during, 18, 117
 functions of, 115–6
 rapid eye movements during, 116–7
 smell, sense of, 28
 smiling, 229
 snail kite, feeding in, 127
 social behaviour, 177
 and breeding, 188
 costs of, 9
 and crowding, 258
 evolution of, 191
 and food finding, 179
 functions of, 176–201
 and predator avoidance, 183–8
 social castes, 187, 241–2
 social density, 259, 262
 social deprivation, 231
 social dominance, 189
 social groups, 239–262
 and animal husbandry, 239, 259
 cohesion in, 244–7
 competition in, 249–56
 composition of, 242–4
 controllers in, 248–9
 descriptions of, 239–42
 and feeding, 179–83
 fission in, 247–8
 initiators in, 248–9
 leaders in, 248–9
 models of size, 242–3
 and predator avoidance, 183–8
 size of, 242, 243
 social insects, altruism in, 193–4
 castes in, 241–2
 kin helping in, 190–1
 social learning, 180–1, 190, 224
 social orders, 241
 linear, 252–3
 persistence of, 252
 triangular, 253
 types of, 252–3
 social rank, 210–11, 253–7
 development of, 257
 and mating, 210–11
 social role, development of, 257
 social skills, development of, 256
 social status, 210–11
 social structure, 239, 248–56
 sodium appetite, 139
 sodium pump, 23
 sodium receptors, 107
Solanum pseudocapsicum, 142
 soldier caste in aphids, 187
 solitary bees, 41
 somatosensory cortex, 51
 sonar, 117
 song, 63–73, 200–1, 206
 and territorial defence, 200–1
 and mate finding, 206
 song thrush, 33
 food searching by, 133–4
 sonogram, 71, 72
Sorex, 137
Sorghum bicolor, 141
 spaced out distribution, 176
 spacing, in fish shoals, 244–5
 in other social groups, 239–40
 sparrows, 20
 specialist feeders, 126–7
 specificity of receptors, 27, 29
 spectral analysis, 60
Spermophilus beldingi, 194
 Sphingidae, 38
Sphodomantis lineola, 61
 spider crab, crypsis in, 160
 spider monkey, feeding in, 129
 spiders, competition in, 251
 group web of, 182
Spilogale gracilis, 164, 166
 spinal cord and mating control, 217, 221
Spodoptera littoralis, 127
 squid, 23
 standing for mating, 234, 235
 starfish, food finding, 130
 starlings, food searching, 134
 food selection, 136
 response to distress call, 169
 response to falcon, 185
 roosting, 180, 242
 surveillance activity, 187
 startle responses, 169, 170, 173
Steatornis, 117
 stereotypy, 98–100
 in action patterns, 62
 by children, 98
 in display, 73
 functions of, 99–100
 in grooming, 58, 61–2
 in zoo animals, 98
 sterile males in pest control, 237
Sterna, 98
Sterna paradisaea, 243
 stick insects, food preferences, 42
 sticklebacks, 17, 90, 95, 132–3, 144, 198–9, 209, 215
 courtship in, 215
 mate selection in, 209
 meal size in, 144
 reactive distance of, 132, 133
 sequences of behaviour in, 90, 95
 territory in, 198–9
 stimulus-response, 17
 stochastic analysis, 60
 stochastic models, 144
 stochastic processes, 60, 144
 stockmanship, 174–5
 stomach, stretch receptors in, 107
Stomoxys, 41
Stomphia, 163
 stotting, 193
 strategies of behaviour, 11–12
Streptopelia risoria, 212, 213, 216
Streptopelia senegalensis, 186
 stress, 120–3
 stria terminalis, and flight, 171
 and parental behaviour, 232
 structure of social groups, 239, 248–56
Sturnus vulgaris, 242
 subordinate animals, 252
 suckling, 227–8, 236
Sula bassana, 198
 superior colliculi, 48, 49, 55
 suprachiasmatic nucleus and rhythms, 100
 surveillance activity, 187
 suspension feeding, 177, 179
 swallowing, 64
 swallowtail butterfly, 34
 swans, social group composition in, 243
 swimming, control of, 74
 development of, 74
 by *Tritonia*, 65, 67
 switching mechanisms in behaviour, 92–8
Symphalangus syndactylus, 136
 synchronisation, of attack, 187
 of behaviour, 161–2
 of breeding, 216
 of egg-laying, 186
 of oestrus, 235
 systematic searching by birds, 133
 for food, 182
 systematic insecticides, responses to, 142
 tachycardia, 169, 170
 tactile hair of caterpillar, 27
 tail autotomy, 166
Talpa, 158
 taste, sense of, 28
 teat order in pigs, 253
 telencephalon, 7
Teleogryllus commodus, 70
Teleogryllus oceanicus, 70
Telmatodytes palustris, 204
 temperature receptors, 26, 28
Tenebrio, 43, 132, 134
 termites, altruism in, 193
 thermoregulation in, 178, 179
 terns, courtship-feeding in, 212
 preening in, 98, 113
 territory, 195–201
 and breeding, 198–200
 competition for, 25
 and crowding, 259
 and foraging, 197–9
 defence by hummingbirds, 148, 150
 and polyandry, 204
 and resource defence, 206
 size of, 190, 197, 198, 199
 testosterone, 3, 212, 221, 231
 and attention, 97
 thalamus, 7
 and defence behaviour, 170
 and movement, 46–8
 and pain, 121
 and vision, 46–8
 thanatosis, 166
 thermoregulation, 3, 5, 108–113, 178
 and aggregation, 178
 in young animals, 112
Theropithecus gelada, 244
Thespesia populacea, 160
 thirst, 86, 87
 threat, 251
 display, 253
 thyrotrophic hormone, 109
 thyroxine, 109
 time series, 21, 92
 time sharing, 95
 timing mechanisms, 3
 timing and predator avoidance, 161–2
Tineola, 119
 Tipulidae, 134
 tits, flock feeding in, 181
 imitative behaviour in, 181
 territory in, 199, 200
 toads, anti-predator display in, 165
 competing for a mate, 208
 eyespots of, 38
 feeding behaviour of, 42, 43
 mate finding in, 206, 208
 osmoreceptors in, 105
 predator avoidance in, 42, 43
 responses to worm-shape, 42–3, 46–8
 water uptake in, 105
 tobacco hornworms, food preferences in, 142, 143
Tolypetes conurus, 163
 tonic response from receptor, 30–1

Subject index

320

- tool use, 105, 140
 torpidity, 108
 toxin avoidance, 118–20
 transition matrix, 60
 transitions in behaviour sequences, 92–8
 tree creepers, huddling in, 178
Trialurodes vaporariorum, 120, 237
Tribolium castaneum, 119
Tribonyx mortieri, 190
Trichopterus, 95
 Trimedlure, 237
Tringa totanus, 132, 135
Tritonia, 23, 64–7, 65, 66
Triturus cristatus, 104
Triturus vulgaris, 96
Troglodytes troglodytes, 178, 203–4
 trout, behaviour when parasitised, 131
 tsetse-flies, host-finding, 205
 mate-finding, 205
Tubifex, 132, 133
Turdoides, 244
Turdoides squamiceps, 190
Turdus ericetorum, 33
Turdus merula, 33, 133
Turdus migratorius, 183
Turdus musicus, 245
Turdus philomelos, 133
Turdus pilaris, 188
 turkey, vocalisations of, 71
 turtles, responses to cliff in, 118

Uca, 251
 udder-finding, 227, 236
 ultrasonic calling by young rodents, 112, 228
 ultrasounds, sensitivity to, 39
 ultraviolet colour detection, 39, 148
 ungulates, parental behaviour, 226–7, 231
 units of behaviour, 56–7
Uria lomvia, 162
 urination, 5, 21, 92–3
 before fleeing, 170
 utility of behaviour, 80, 81

 variability within species, 10, 13–15
 vasopressin, 106
Venturia canescens, 132
 vervet monkeys, maternal behaviour, 229
 mating success, 211
Vespa, 161
 veterinarians as observers, 22
Vicugna vicugna, 243
 vicuna social group composition, 243
 vigilance and predator avoidance, 162, 184
 visual cliff, 118
 visual analysers, 46, 47, 49–55
 visual cortex, 45–55, 49
 visual pattern recognition, 42–55
 visual sensitivity and oestrus cycle, 219

 visual systems, development of, 15, 19, 51–5
 voles, periodicity in, 100–2
 sequences of behaviour in, 90
 stereotypy in, 99
 vomiting, 64
Vonones sayi, 167
Vulpes vulpes, 251
 vultures, finding carcasses, 131

 waders, mating systems in, 204
 wagtails, individual distance, in, 185
 roosting of, 185, 186
 territory and food, 198, 199
 wasps, coloration of, 161
 defence behaviour, 187
 water conservation, 104–6
 and aggregation, 178
 water level in body, regulation of, 3, 5, 104
 weak individuals, welfare in social group, 262
 weaning, 261
 weapons, against predators, 167
 display of, 187–8, 251
 weaver birds, courtship display, 209
 mating systems in, 203–4
 nest-building by, 179
 whining, 64
 whitethroated sparrow, 73
 song of, 73

 white-eye, 37
 white fly, 120
 reproduction in, 237
 wood-lice, turn correction by, 104
 water conservation in, 104
 water uptake in, 105
 wolves, confident display, 251
 food selection in, 139
 leaders in social groups, 248
 wood pigeon, feeding in, 136–7
 wrens, huddling in, 178
 mating systems in, 203
 wryneck, anti-predator display of, 165

Xanthocephalus xanthocephalus, 200, 204

 yolk utilisation, 17–20
 young animals, problems of, 17
 requirements of, 223–4
 vulnerability of, 17

 zebra finches, feeding
 periodicity in, 100
 mate selection in, 212–4
 meal size in, 144
 preening in, 59–60
 zeitgeber, 21
Zenaidura macroura, 212
Zeus faber, 166
Zonotrichia leucophrys, 73
Zosterops lateralis, 37