# Index

adaptation 4, 5, 16, 122 adaptation and optimality 113, 127n, 132-6, 150n connection between adaptation and speciation 126-7, 170-1 adaptationism 16-20, 113 adaptationism as a methodological technique 134-6 adaptationism as a robust process explanation of evolutionary change 137-9, 189, 212 adaptationism as an externalist explanation of evolution 154, 182-9 adaptationism defined with respect to clades 162, 189-91 Sober's definition of adaptationism 132; discussed 133-6, 138-9, 189 Alexander, Richard 25 Allen, Colin 199, 203-4, 205, 217 altruism 44, 81-2 reciprocal 86-7 arboreal clambering hypothesis 183, 186, 190-1, 252 Astington, Janet 230-1 avatars 119-20, 146, 147 Balleine, B. W. 274 Bateson, Patrick 76, 79n behaviour reading see metarepresentation behavioural programmes 226-7, 254-5

Bennett, K. D. 174, 175

- Bennett, Jonathon 205, 206
- Bickerton, Derek 235
- Boesch, C. 239–40n
- Buss, Leo 73, 84, 99, 101
- Brandon, Robert 41–2, 50n, 51n, 62, 146, 150–1n
- Byrne, Richard 25, 217, 219n, 224, 225, 226–7, 228, 230, 254–5, 257, 258n, 284, 285–6
- Cambrian explosion 109
- Cheney, D. 209, 215, 222, 271
- Clark, Andy 264–5
- cognitive evolution

cognitive evolution and the Environmental Complexity Hypothesis 181–97, 241–4, 247–8, 257–8, 260–2, 265–6; as an externalist hypothesis 181–8, 285–6; as an adaptationist hypothesis 189–91, 261, 285; is behavioural plasticity a single trait 191–2, 200–1, 255–6; response breadth as a precondition of the evolution of preference 281–2 cognitive evolution and the

evolution of belief 21, 24, 237–8, 244–8, 280; tracking robustness and response breadth distinguished as

305

cognitive evolution (cont.) evolutionary precursors to belief 268-70, 286n cognitive evolution and the evolution of preferences 21, 250-7, 273-6, 282, 283, 284-6; non-representational motivation 248-9, 250, 272-3, 276-7; intermediates between physiologically based motivation and preferences 250-1; distinction between preference structure and a cost function 248-9, 272-3, 277-8, 283; role of planning 254-5, 258n, 284; dependence of the evolution of preference on belief but not vice versa 256-7, 274-5, 281-2; affect and preference 275-8, 283, 284-5, 287n cognitive evolution and representation as a "fuel for success" 192-3, 194, 248, 280 stimulus bound organisms versus multiple tracking 23, 192, 221-2, 244-8, 258n, 262-4, 268-70 transparent versus translucent environments 23, 24, 245-8; role of hostility in the evolution of translucence 246-8, 264-6, 270 - 1competition 145, 147-8 competitive exclusion 148, 155-6, 166 communities 145, 146, 152-3, 194 community assembly rules 154-6, 159-61 the role of the community in the explanation of convergence and character displacement 156 communities in relation to species 157 the role of specific taxa in community organisation 162-4, 177n

### Cooper, Greg 164, 177n

### Index

co-ordinated stasis 156-7, 173, 178n Cosmides, Leda 135 contingency in evolution 138 in community assembly 158-61, 172 Cronin. Helena 5 cumulative selection 6,79 Currie, Greg 233 Damuth, J. 106n, 145-8, 149, 151n Darwin, Charles 152, 158 Dawkins, M. 251 Dawkins, Richard 5, 6, 8-9, 29-49, 53, 54, 56, 65, 68-9, 70-1, 72, 76, 91-2, 95, 101-2, 105n, 116, 121-2, 127n, 133, 134, 136, 143-4, 182, 202 de Waal, Franz 208, 217, 224, 267, 268 Dennett, Dan 5, 106n, 206, 214, 218, 222, 224, 279 demes 126, 143 developmental constraints on evolution 19-20, 112, 113, 136 - 8Developmental Systems Theory 10, 54-6, 56-8 criticisms 58-60, 242 Devitt, Michael 230 Diamond, J. 133, 154, 164 Dickinson, Anthony 262, 273-9, 282, 287n diversity 4, 109 Dretske, Fred 199, 209, 211, 258n Dugatkin, Lee 88–93, 97 Dunbar, Robin 25, 241 ecology and evolution 152-78, 195-6 density dependent versus density independent factors in evolution 165-8 ecology's role in describing adaptive landscapes 153-4, 168,

177n the importance of species being members of many communities 168–71

306

## Index

the role of ecology in phyletic evolution and punctuated change 157; the conditions under which phyletic evolution occurs 171-4; conditions under which peripheral isolates form 174 - 6effect hypothesis see species selection and species sorting Evans, Chris 198, 199 Explanation explanation and causation 33-5 explanation and reduction 129-31, 149-50, 243-4 externalist explanation 17-18, 154, 182-3, 184-8, 196 robust process versus actual sequence explanations 18-19, 131-2, 136, 150n, 177n, 207-8, 210 Eldredge, Niles 109-10, 118-19, 125-7, 128n, 139, 174 environment 89-90, 101-3, 146-7, 156, 162, 169-70, 176, 182-8, 245-8, 255-6 evolution of cognition see cognitive evolution evolutionary trends 115, 123 extended phenotype 8-9, 45-6, 71, 72, 91-2, 93-4, 101-2, 104n, 182, 202–3, 204 fitness classical 44 fitness, inclusive 44, 82 defined as a reproductive propensity 193-4 Fodor, Jerry 79n, 199, 205, 206, 214, 279 forager's dilemma 274, 278-9, 287n frequency dependent selection 31, 32-3, 121-2 frame problem 242, 243 genes as bearers of information 9-11, 57, 61-3, 64-6

as outlaws 4, 8, 43-4, 95 as replicators 7, 11, 29-30 as units of selection 4, 5, 6, 8-9, 29-49, 54, 72-3, 77-9, 82 effect on phenotypes 36-42, 56-8, 61-3, 184 genetic drift 135 green beard genes 44,95 genotype/phenotype distinction see replicator/interactor distinction Ghiselin, Michael 128n Godfrey-Smith, Peter 16-17, 23, 127n, 133, 150, 181-97, 200, 241-2, 247, 248, 258n, 260-2, 265-6, 280, 286n Goldman, Alvin 237-8 Goodall, Jane 217 Goode, R. 197n Gopnik, A. 228-9, 230-1, 236 grades 223 Gray, Russell 55, 59, 60, 62, 79n, 184 Griffin, Don 200 Griffiths, Paul 55, 59, 60, 62, 75, 79n, 105n, 138, 163, 164, 197n Gould, Stephen J. 4, 30, 36-7, 41, 42, 109-10, 132, 135, 136-7, 138, 157, 176, 195 Griesemer, Jim 68, 79n group selection 12-14 group selection and altruism 81-2 group selection and the defection problem 82-3, 85, 86-7, 104n group selection as a hypothesis about interactors 83 group selection as one of several adequate descriptions 90-96, 104–5n kin selection a special case of group selection 85-6, 88, 95, 96 reciprocal altruism a special case of group selection 86-7, 94 trait groups 84-6, 94-6 trait groups and superorganisms 96-7, 98-101, 101-3, 105-6n

Ham, R. 225 Hamilton, William 44–5, 82, 87, 104n

handicap principle 266 Hauser, Marc 199, 203-4, 205, 258n Heyes, Celia 215, 216, 217 hetrozygote superiority 31-6 Heisler, L. 106n historical constraints on evolution 19-20, 112, 113, 136-8 Hoffman, A. 127n Holldobler, B. 245 Hull, David 7, 53, 55, 65, 67-8, 70-1, 101, 116, 127n, 128n Hutchinson, G. E. 153, 154, 169 imitation 223-9, 239n, 258n, 270 empirical tests for imitation 227-8, 239-40n imitation as copying a behavioural program 226-7, 254-5 imitation distinguished from other forms of social learning 224-5 imitation in human infants 228-9, 240n, 286n Intermediate Disturbance Hypothesis 166 - 7intentional systems 21, 24, 229-33, 256-7, 273-8 intentional system distinguished from subintentional systems 222-3, 262, 273-4, 278-9, 280 Fodor's view of intentional systems contrasted with Dennett's 279-80 the evolution of beliefs and preferences are not a package deal 256-7, 274-5, 281-2 interactors 7, 12-14, 65, 83-4, 98-101, 101-3, 103-4n, 188 island biogeography 160-1 Jackson, Frank 18, 131-2, 207, 210 Jagger, Mick 260, 277 Jarrold, C. 234-5 Jolly, A. 217

Kingsland, Sharon 177n kin selection 85–6, 87–8 Kitcher, Philip 116, 117, 128n

### Index

Krebs, J. 202 Krakatau 158, 160-1, 163, 165, 173 Lack, David 81 Lamarckian evolution 69-70, 106n Lawton, J. H. 172, 173 Leslie, A. 219, 234-5 Levins, Richard 4, 182 Lewontin, Richard 4, 17, 30, 31, 50n, 132, 135, 162, 176, 182, 185, 188, 195 Lloyd, Elizabeth 4, 65, 106n Lorenz, Konrad 249, 253 MacArthur, Robert 15, 159-60, 161 MacFarland, D. 248-9, 272-3 Machiavellian Intelligence Hypothesis see social intelligence hypothesis Manning, A. 251 Marler, Peter 198, 199 mass extinction 141, 141-2, 156, 195 Maynard Smith, John 5, 52, 81, 90-1, 96, 117, 122, 127n, 134, 136 Mayr, Ernst 3, 41, 42, 111, 119, 127n Meltzoff, A. 227–8, 236 memes 54,77 mental representation theories of mental content 201, 202, 203, 211, 281, 285 theories of which states have content 199-200, 201-3, 204-5, 205-7, 208-9, 210-11, 220 - 2metarepresentation 22, 26, 199 metarepresentation as part of an internalised theory of intentional psychology 223, 230-3, 235-6 the connection between metarepresentation and imitation 225-6, 228-9, 258n the connection of metarepresentation with symbolic play 219n, 233-5

the false dichotomy between "behaviour reading" and "mind

308

Index

reading" 213-15, 217, 218, 267 - 70the issue of metarepresentation amongst nonhuman primates 212-13, 215, 216-17, 218, 268-70 the methodological problems of establishing metarepresentation 215, 217, 243-4 the relation of metarepresentation to social intelligence hypothesis 213, 214-15, 218, 223-4, 237-9 Millikan, Ruth 79n, 199, 200, 201, 202, 203, 204, 205, 211, 219n, 280, 281 mind reading see metarepresentation mirror self recognition 223 modularity 231-3 Moss, Lenny 67, 78 natural selection 4, 5, 16-20, 34-5, 47–9 consequence laws and source laws of natural selection 154-5 legitimacy of averaging fitness across a whole population 92-4, 167-8 natural selection as an explanation of stasis 112-13 natural selection and selective environments 145-7; conditions under which natural selection generates phyletic evolution 171-4 whether natural selection defines or explains adaptation; natural selection, fitness and adaptedness 134-5, 193-4, 194-6 Neander, Karen 104-5n niche 119, 123-4, 135, 153, 154, 155, 156, 165-6, 169, 194, 196 Orzack, Steve 136, 185 Oyama, Susan 79n, 184, 186 organisms as interactors 7, 45-6, 70-1, 96-7, 188

as units of selection 4, 29, 53-4, 70-2, 89-90, 92-3 how did the organism evolve? 72-3, 84, 99, 106n paradox of the plankton 155-6 Pettit, Philip 18, 131-2, 207, 210 Povinelli, D. 183, 186, 190-1, 216, 221, 224, 252 pretend play see symbolic play Premack, D. 213, 216, 224 punctuated equilibrium ecological causes of punctuated equilibrium 156-7, 174-6 and species selection 115-20 and the nature of species 115 as a theory of evolutionary patterns 110-11 as a theory of process 111-13 Quine, W. V. O. 239n Raup, David 141, 195 reciprocal altruism 86-7 Red Queen Hypothesis 164-5 Reeve, H. K. 88–93, 97 replicators 7, 11, 12, 54, 74 as designed mechanisms that function to ensure similarity across generations 64-6 non-genetic replicators 66-70, 73, 75-7,77-9 replicator/interactor distinction 7, 13-14, 15-16, 82, 83-4, 116-18 Ricklefs, Robert 173 Russon, Anne 244 Schull, John 123-4, 142-3 second order intentional systems see metarepresentation Seyfarth, R. 209, 215, 222, 271 sex ratio 87 situated agency 241-4 limits 244-8 simulation theory 231, 232, 234, 237 - 8

social intelligence hypothesis 22, 25-6, 213, 229-30, 226-39, 255, 266 - 71Sober, Elliot 3, 4, 12–14, 30, 31–6, 73, 86-7, 117, 127n, 132-6, 138-9, 147, 154-5, 167, 185, 187-8, 212, 276 species 109-28 biological species concept 119 cladistic concept of species 125-6 one-many relation of niches and communities to species and its consequences 146-7, 157, 168-71 speciation of peripheral isolates 111-12, 125-7, 174-6 species as interactors 117-23 species as replicators 116-17, 139 species defined by specific mate recognition systems 119-20, 125 the role of species in macroevolution 115, 125-7, 157, 170 - 1species selection 14-16, 114 explanatory power of species selection 123-5 species selection as an explanation of evolvability 142-4 species selection as a thesis about interactors 117-23, 142-3, 145 - 9species selection as a thesis about replicators 116-17 species selection distinguished from species sorting 115-16, 118, 121-2, 139-42, 144-5 Stanley, S. 109-10

#### Index

symbolic play 219n, 223, 233–5 Symons, D. 135

theory of mind see metarepresentation Tinbergen, Niko 199, 206, 210, 253 Thompson, John 169, 170 Thornton, Ian 158, 161, 163, 165 Tomasello, Michael 266-7 Tooby, John 135 tuatara 76 turnover pulse hypothesis 175-6 units of selection 4, 5, 6-16, 53-5, 72-3, 75-9, 90-6, 98-103 van Valen, Leigh 164-5 Valentine, J. 141-2 vehicles see interactors Vrba, Elizabeth 127n, 141, 144-5, 174-5, 175-6 Wade, Michael 87 Weismannism 69–70 Whiten, Andrew 25, 217, 219n, 224, 225, 230, 271 Williams, George C. 5, 6, 12, 81, 82, 87, 105n, 128n, 134, 136, 139 Wills, Chris 143-4 Wilson, David S. 12-14, 83-104, 135-6, 147, 167, 187-8, 276 Wilson, E. O. 245 Wimsatt, Bill 69 Woodruff, G. 213 Wright, Sewell 135, 143 Wynne-Edwards, V. 81

Zahavi, A. 266