

Index

Page numbers in *italics* refer to figures.

- adaptation 36, 118, 117–27
Alberch, P. 16
anatomy 166
ancestor 6, 18, 152
annelid 170
arthropod 170
assimilation, genetic 19, 146
axis, body 133, 155, 179
- Bateson, W. 13, 106
bias, developmental 12, 16, 101–2, 103–4,
 105–16, 195, 201
bicoid 48
Bilateria 173
bithorax 145
bivalve 184
body plan 31–2, 46–7, 62, 65, 152
Bonner, J. T. 1
Brakefield, P. 147
breeding 205
butterfly 147–8
- Cambrian
 explosion 61
 Period 58
cascade 50, 51, 85, 176, 187, 188
cell number 1, 7
centipede 59, 63–4, 177, 206
character 167–70
Cheverud, J. 205
chick 41
chimpanzee 163–4, 165
chordate 170
cladistics 167–70
Clark, R. B. 182
Clarke, B. 56
coadaptation 36, 117–27, 195
computer 169
constraint, developmental 16, 74, 115, 205
contingency 88, 102, 103–4, 113–16
- convergence 169–70, 184–5
co-option 186, 198
covariation 99
creationism 70
- Darwin, C. 9–13, 26–39, 65, 70, 106, 119,
 134
Dawkins, R. 76, 109, 192–3
de Beer, G. 19
de Vries, H. 14, 110
Deuterostomia 173
digit 133–4
disc, imaginal 45–6, 136
distal-less 176, 177
distribution, frequency 90–1
DNA 175–6
Dobzhansky, T. 34
Dover, G. 15
drift, genetic 14–15, 38
drive
 developmental 16, 116
 molecular 15
duplication and divergence 154–6, 189–90,
 197
- Ecdysozoa 173
echinoderm 170
ecology, behavioural 23–4
Ediacaran fauna 59
egg 47–8
egg timer 135
Eldredge, N. 62
engrailed 49, 176, 177, 186–7
environment 122–7, 140–51, 196
epigenesis 85
evolution, direction of 37–9, 88–116
evolvability 153–8
explosion, evolutionary 61–2
eye 182
eyespot 147–8

232 INDEX

- Fabricius, H. 42
faith 209
Fisher, R. A. 34, 73, 106, 109, 110, 119
fitness 95, 96, 122–7
 profile 126, 125–7, 196
Ford, E. B. 34, 109, 110
fossil 24, 55, 60, 57–65
frog 41
fruitfly 41, 43, 145–6, 179, 188
fundamentalism 210
Fusco, G. 196
gene
 duplication 15
 expression 49–50, 177, 177
 names 48
 number 7
 selfish 76–8
 switching 48–50, 176
generalized 156–8
genetics
 developmental 24
 ecological 23, 27
 population 22–3, 159
 quantitative 23, 204–5
genome 7
Geoffroy St Hilaire, E. 17
Goldschmidt, R. B. 14, 106, 108, 208
Gordon, R. 51
gorilla 163–4, 165
Gould, S. J. 11, 16, 25, 62, 72, 88
gradient 48
growth, correlation of 31
Haeckel, E. 17–18, 135
Haldane, J. B. S. 34
hemichordate 170
Hennig, W. 74, 167
heritability 205
heterochrony 81–2, 195, 204
heterometry 83
heterotopy 82, 195
heterotypy 83
hierarchy 50
history
 of developmental biology 41–3
 of evolutionary biology 9
homeobox 175–8
homeodomain 176
homeosis 145, 175
Hominidae 163–4
homology 24, 152–3, 183–4
Hox gene 155–6
human 163–4, 165
hunchback 48
Huxley, J. 19
insect 177, 188
Kimura, M. 14–15, 29
Klingenberg, C. 93
Koestler, A. 71
Krüppel 49
Kuhn, T. 69
Lamarck, J. 11, 19
landscape, adaptive 94, 93–102, 103–4,
 107–15, 207–8
larva 129, 136
Lawrence, P. 47, 179
Lewis, E. 43
Lewontin, R. C. 16, 25
life cycle 1–3, 6–8, 32
limb 154–5, 183–4, 187–9
Lophotrochozoa 173
macroevolution 62
Malpighi, M. 42
mammal 98, 128–9
Mayr, E. 34
McKinney, M. 81
McNamara, K. 81, 204
Medawar, P. 53
megaevolution 62
Meinhartdt, H. 51
Mendel, G. 33, 210
metamorphosis 45, 45–6
method, scientific 68–9, 209
microevolution 62
model system 40–3
modern synthesis 34–9, 73–4, 191–4,
 199–200
modularity 153–6, 188, 197
mollusc 170
monster, hopeful 108
mouse 41
mutation 35–8, 79, 105–16, 132–3
mutationism 13–14
natural history 159
natural philosophy 159
nematode 170, 171

- nemertine 170, 171
- neo-Darwinism 20, 34–9, 191–4
- novelty, evolutionary 78–82
- organizer 42
- orthogenesis 13, 74, 121
- outgroup 168, 168
- palaeontology 159
- Panchen, A. 139
- pan-externalism 23, 36, 119
- pan-selectionism 23, 38, 98, 119
- parsimony 182
- Pasteur, L. 26
- pathway, developmental 49–50
- Phanerozoic era 61
- phonetics 166–7
- phenocopy 145–6
- phylogenetics 20–2
- phylogeny 173, 159–74, 197
- Pigliucci, M. 147
- placenta 129
- plasticity 144–51
- polyphenism 148
- Popper, K. 69
- population 79–80
- primordium 153
- Protostomia 173
- punctuated equilibrium 62, 202
- Raff, R. 137
- reaction norm 150, 146–51, 196
- recapitulation 17–18
- religion 209
- reprogramming, developmental 84, 84–7, 114–16, 151, 195
- revolution, scientific 69–74
- Richardson, M. 135
- Roux, W. 42
- rudiment 136
- saltation 109
- scenario, adaptive 140
- Schlüting, C. 147
- Schmalhausen, I. 19
- Schwenk, K. 124
- segmentation 46, 179, 181, 185–7
- Seilacher, D. 60
- selection
 - external 123–7, 128
- internal 121–7, 128, 195
- kin 77
- natural 27–8, 32–3, 70–3, 80, 97, 103–4, 113–16, 201
- species 15
- shape 142
- Simpson, G. G. 34, 62
- snail 133, 141, 140–5
- Sneath, P. 166
- sociobiology 23
- Sokal, R. 166
- specialized 157, 156–8
- Spemann, H. 42
- Stanley, S. 15
- starfish 188
- Stoltzfus, A. 74, 116
- strawman 120, 192
- symmetry 178
- systematics 167
- tagma 179
- tardigrade 170, 171
- thale cress 41
- theory, general 159, 209
- Thompson, D'A. 19
- trait 52
- transplant experiment 143–5
- tree, evolutionary 4, 3–6, 162, 168, 159–74
- van Valen, L. 7
- variation 10–11, 14, 91, 88–93, 96, 105, 158, 200
- Vendozoa 59, 60
- vertebrate 59, 62–3
- von Baer, K. E. 16–17
- Waddington, C. H. 19–20, 145
- Wagner, G. 124
- Wallace, A. R. 12–13, 89–90, 97, 100, 106
- water bear 170, 171
- whale 104
- Whyte, L. L. 74, 121
- worm 41, 170, 171
- Wray, G. 137
- Wright, S. 34, 93
- Yampolsky, L. 74, 116
- yolk 135
- zebrafish 41