

## Index

- adaptation: as product of process of  
 adaptation, 37; process of, 37; relation to  
 selection, 4–5
- adaptation explanation, 197
- adaptationist program, 197
- adaptedness: defined, 24, 50; relation to  
 Darwinian fitness, 9
- animal communication systems, 91
- artificial selection, as a type of natural  
 selection, 18–19
- asexual species, 116
- causation: and ontological reductionism,  
 189–92; recognition of causal patterns, 194
- chance set-up, 52
- coevolution of organism and environment:  
 Lewontin's view, 161–2, 176; model of  
 167–74; phytometer method and, 174–6
- cohesion, 109
- culture, 79–82; Bonner on, 81; language and,  
 82, 99–103
- Darwinian explanation of evolution, 8
- definitions, descriptive vs. stipulative, 4
- determinism, 182–3
- differential reproduction, causes of, 35
- environment: constructionist view of, 161–2;  
 ecological, 131, 164; external, 131, 162–4;  
 selective, 131, 164–5; selective  
 environmental heterogeneity and behavior  
 139–40; spatial structuring of, 172–3;  
 rapidly changing, 75; role in the Principle  
 of Natural Selection, 53–5
- ESS reasoning, 198–9
- evolution in heterogeneous environments, 158
- evolutionary theories: contrast between  
 physical and biological, 34–5; contrast  
 between teleological and nonteleological,  
 34–6, 42; Darwinian, 6–7; in general,  
 31–2; neutral theory, 7
- experiment: contrast of experimentation in  
 biology vs. physics, 156; contrast with  
 observations and descriptions, 149–51;  
 natural, 151; relationship to theory,  
 156–9; two-dimensional characterization  
 of, 150–4, value of, 154–5
- fitness: as measure of actual reproductive  
 success, 48; genotype–environment  
 interaction in, 166
- founder principle, 17
- frequency-dependent selection, 165–7, 173–4
- group selection, 61, 125, 130–2; altruism and  
 190–1; intrademic vs. interademic, 137;  
 screening-off and, 62
- heritability: as empirical presupposition of  
 the Principle of Natural Selection, 56;  
 genetic definition, 72, 94; quantitative  
 genetic or phenotypic definition, 70–1, 93
- holism: relation to Cartesian dualism, 184;  
 relation to mechanism, 185; relation to  
 vitalism, 184–5; Smuts and Haldane on,  
 184–5
- human sociobiology, 64, 82
- hypothesis test, 150
- hypothetico-deductivism, 147–8
- iconicity: contrast with symbolicity, 86;  
 perceptual 87; phylogenetic, 87–90
- icon–symbol continuum, 90–1
- individuality, 107; components of, 108–9;  
 problems with application to species,  
 109–11

- inductivism, 147–8  
 inheritance of acquired variation, 76–9  
 integration, 108  
 interactors: hierarchy of, 132–6; Hull's definition, 126  
 interbreeding, as ranking criterion of species, 117  
 learning: instructional, 100; observational, 100, trial-and-error, 99  
 levels of selection: contrast with units of selection 59–64; general definition 62, 132; levels of benefit and, 140; screening-off and, 60–4, 128–30  
 logical positivism, 46  
 manipulation, 149  
 Mayr's distinction between functional and evolutionary biology, 32–3  
 mechanism: as a causal pattern, 194; as a normative thesis in biology, 196–200; general characterization 192–6; Hogben on mechanism vs. holism and reductionism 186–8; of evolution 193; open-endedness of 192–3; vs. phenomenological 194–5  
 metaphysics: experimental, 202; presuppositions of reductionism and holism 192, 201–2  
 monophyly, 115, 118–21  
 natural languages: as phenotypic transmission system, 102; properties of 85, 101  
 niches: Grinnell and Elton vs. Hutchinson, 161; Lewontin on empty niches, 161, 174  
 organismic selection, 128–30  
 parameter measurement, 150  
 parasitism, 173–4, 178  
 phenotypic plasticity, 73, 95; relation to behavior, 74; selective advantages and disadvantages of, 74–5, 95–7  
 phenotypic transmission, 78; defined, 80; selective advantages of, 79, 97–9  
 phytometer method, 164, 175–6  
 pluralism: with respect to scientific methodology, 182; with respect to species concepts, 111  
 Principle of Natural Selection: as organizing principle, 51; as schematic law, 51; empirical content of, 50–1; empirical presuppositions of, 52–6; role in evolutionary theory, 47–57; statement of, 47  
 propensity interpretation of probability, 24, 50  
 random drift, 7, 38, 47  
 reductionism: as a type of mechanism, 195–6; Crick's definition, 181; distinction among ontological, methodological, and explanatory, 180; empirical refutation of, 188–92; multi-level vs. single-level, 182; relation between ontological and methodological 182–3, 201–2; theory reduction, 180  
 reflective equilibrium, 204, n. 29; between ontology and methodology, 201–2; mechanistic approach to, 202  
 relative adaptedness: approaches to defining, 5, 15–23, 49; desiderata of definitions of, 11–15; dispositional or propensity definition, 50; role in the Principle of Natural Selection, 48; schematic definition, 36  
 replicators: Dawkins' definition, 125; hierarchy of, 136–8; Hull's definition 126  
 ritualization, 87–90; stages of, 88–9  
 schematic definition, 25, 36  
 schematic law, 26, 51  
 scientific laws, 11  
 scientific method: as account of relationship between theory and experiment, 147–9; grades of methodologies, 175  
 screening-off: as guide to levels of selection, 60–4, 128–30; defined, 60  
 selfish genes, 133  
 sociobiology, 69–82; criticisms of, 69  
 species concepts: grouping vs. ranking, 113–14; phylogenetic species concept, 111–22; species as individuals, 107  
 struggle for existence, 9  
 symbols: characterization of, 90; contrast with icons, 86  
*t*-allele, 63  
 tautology problem, 10, 48–9  
 taxonomy of scientific theories, 31–6; erotetic approach, 32–6  
 teleological explanations, 30–42; as answers to what-for-questions, 41

Cambridge University Press

978-0-521-49888-3 - Concepts and Methods in Evolutionary Biology

Robert N. Brandon

Index

[More information](#)*Index*

221

testability, 13; trade-off between testability  
and generality, 24–6

theory of natural selection, structure of, 27,  
46–57

unification, as a virtue of scientific theories, 27  
units of selection. Wimsatt's definition. 59

vehicle, Dawkins' definition, 126  
vitalism, 184

Weismannism, 127

what-for-questions, 33–6