

# Index

- $\alpha$ -thalassemia, 91
- adaptation, 121, *See also* perfect adaptation; relative adaptation  
     historical and ahistorical definitions, 121–123
- adaptations, 1, 29, 77, 116, 121, 123–127, 146, 174
- agnosticism, 32, 34–35, 40, 167–168
- AIDS (acquired immune deficiency syndrome), 30
- alleles, 130
- allopatric speciation, 135–137
- allopatry, 135–137
- Alvarez, Walter and Luis, 143
- American Association for the Advancement of Science, 31
- anagenesis, 137–138, 141
- Anolis* lizards, 136
- Antennapedia* complex, 118
- antibiotic resistance, 97
- anti-evolutionism, 150–151, 165
- apomorphies, 101–102
- archaeobacteria, 96–97
- Archaeopteryx*, 56, 102
- argument from design, 23, *See also* Paley's divine designer argument
- arthropods, 112, 120, 154
- artifacts, xix, 25–26, 61, 63  
     Dawkin's argument, 27  
     essence of, 53–57  
     teleological explanations, 46–53, 63
- artifact-thinking argument, 26, 51, 64
- artificial selection, 56, 70–74, 83
- atheism, 32–33, 149, 167–168  
     militant, 165, 169
- bacteria, 96–98, 129
- Baer, Karl Ernst von, 74
- barnacles, 79, 82
- bat wings, 102, 107, 110, 118, 154
- believing, grounds for, 36–38
- bird wings, 102, 107–110, 154
- birds, 45–47, 49, 53, 55, *See also* Galápagos finches
- Bithorax* complex, 118
- blind watchmaker, xviii, 27
- Chambers, Robert, 82
- chimpanzees, 112, 119, 133, 154
- chordates, 112, 154
- clades, 95, 137, 140
- cladogenesis, 138–139, 141–142
- cladograms, 137–138
- common characteristics, 90, 92–94

- common descent, 83, 91
  - homology and, 98–107
- conceptions, 42–43
- concepts, 42
- conceptual change, 42–45
  - in evolution, 62–69
- conceptual conflict, 65
- contingency, 131–133, 174
- convergence, 107–115
- Conway Morris, Simon, 32, 34, 40, 164, 167
- Copernicus, Nicolaus, 44–45
- Coyne, Jerry, 160
- creationism, xv, 3, 90
  - attitudes relating to, 10–22
  - children's views of, 24–25
- Darwin, Charles, 162. *See also* Origin of Species
  - analogy between artificial and natural selection, 72–74
  - conceptual shifts, 75–81
  - metaphor for the process of selection, 116–117
  - principle of divergence, 74–75
  - selection for* view, 126
  - social context of his theory, 83–85
- Dawkins, Richard, 169
  - blind watchmaker argument, xviii, 27
  - religious views, 32–34, 40, 164, 167
  - science and the existence of God, 159–160
- de Regt, Henk, 152
- death, 29–31, 149
- deep homology, 114
- deistic evolution, 3
- Dennett, Daniel, 160
- descent with modification, 80, 157
- design
  - intentional, 173–174
  - natural, 161–162
- design teleology, 45–53, 62
  - conceptual change and, 63–68
- deuterostomes, 120
- developmental repatterning, 119–120
- digit formation in tetrapods, 98
- discriminate sampling, 129
- DNA sequences, 93–94, 104–107, 111–112, 116, 118–119, 130–131, 157–158
  - changes in, 127, 156, 173
  - eukaryotic, 97
  - Hox*, 118
  - regulatory, 114, 120, 136–137
  - similarities between species, 154
  - Ubx (Ultrabithorax)*, 99
- dolphins and sharks, 65–68, 81, 90, 99, 110
- domains, 96
- draft, 130–131
- drift, 129–130, 154, 158
- Drosophila melanogaster*, 114
- drug resistance, 129
- elimination, 29, 126–127
- endemic species, 77
- epistemology, 37
- essence
  - of artifacts, 53–57
  - definition of, 53
  - of organisms, 55–58, 64
- essentialism. *See* psychological essentialism
- eukaryotes, 96–97, 114, 133
- Eurobarometer, 2
- Eurobarometer 224: Europeans, Science and Technology* report, 4–7
- Eurobarometer 225: Social Values, Science and Technology* report, 4–7
- evil, 162
- evolution, definition of, 1
- evolutionary developmental biology (evo-devo), 115–120
- evolutionary events, 133–135
- evolutionary explanations, 142–147

## 190 INDEX

- evolutionary theory, virtues of  
 concision (unification), 156  
 durability (survival over tests), 157  
 empirical fit (support by data),  
 153–154  
 explanatory power, 158  
 external consistency (consonance with  
 other theories), 156  
 fertility (novel predictions, anomalies,  
 change), 156–157  
 internal coherence (no additional  
 assumptions), 154–155  
 internal consistency (no  
 contradictions), 154  
 optimality (comparative success over  
 other theories), 157–158  
 simplicity (testability and applicability),  
 155–156
- evolutionary trees, 94–96, 100, 102,  
 104–107, 110–112
- exaptation, 123–124
- extinction, 138–140, 143–146, 174
- family trees, 92–96, 104
- fitness, 121
- Galápagos finches, 76–77, 136, 140, 154,  
 156
- Galápagos Islands, 76–78
- Galileo, Galilei, 45
- Gallup, 2  
 evolution surveys, 7–11  
 surveys compared with Pew findings,  
 11–17
- genetic draft. *See* draft
- genetic drift. *See* drift
- genetic material, 56–57, 92, 97, 116
- genotype, 137
- geocentric model, 44
- geographic isolation, 135–136
- Geophilomorpha, 119
- God  
 arguments on the existence of, 159–162  
 public's belief in, 6–7, 17–22
- God of the gaps argument, 151
- Gogonasmus man, 100
- gorillas, 112, 154
- Gould, John, 77
- Gould, Stephen Jay, 169  
 concept of contingency, 131  
 religious views, 32, 34–35, 40, 164,  
 167
- gradualism, 142
- Haack, Susan, 158–159
- Haldane, J. B. S., 157
- heliocentric model, 44–45
- hemophilia A, 91
- Herschel, John, 74, 84, 88
- heterochrony, 119
- heterometry, 119
- heterotopy, 119
- heterotypy, 119
- HIV (human immunodeficiency virus), 143
- homology, 98–107, 157
- homoplasy, 107–115, 157
- Hooker, Joseph Dalton, 81, 83, 86, 162
- horizontal DNA transfer, 97, 107, 112,  
 129
- human evolution, 6  
 beliefs relating to, 3, 31  
 misrepresentations of, 1
- Hume, David, 23, 30, 161
- Huxley, Thomas Henry, 82, 86–88
- hypotheses, 142–143, 157
- indiscriminate (parent or gamete)  
 sampling, 129–130
- inference to the best explanation (IBE),  
 142–143
- intelligent design, xix, 3, 26, 33
- intuitions, 25–26, 42–45, 61–62

- Ipsos, 2  
 2011 study, 17–22  
 irreducibly complex systems, xvi
- justified belief, 37–39
- Kelemen, Deborah, 26  
 Kepler, Johannes, 45  
 Kitcher, Philip, 170  
 K–Pg boundary, 143–144  
 K–Pg extinction, 143–146
- Lamarck's theory, 81  
 limited perfection, 74  
 linkage, 126  
 Linnean Society, 83  
 Lithobiomorpha, 119  
 Lyell, Charles, 82–83
- macroevolution, 140–142  
 Malthus, Thomas, 72–74, 78, 83  
 Martineau, Harriet, 72  
 mass extinctions, 139. *See also* K–Pg extinction  
 materialism, 165  
 McMullin, Ernan, 153  
 microevolution, 140  
 migration, 77  
 Milne-Edwards, Henri, 74–75  
 misallodoxy, 169  
 misconceptions, 42–43, 45  
 morality, 165–168  
 multicellularity, 114–115
- natural selection, xviii, 27, 29, 33, 65, 68–69, 116, 154, 158, 161, 174  
 adaptation and, 121–123, 126  
 belief in, 31  
 compared to stochastic processes, 127  
 conceptual foundations, 82–83  
 criticism of, 86–88  
 development of the theory of, 75–81  
 importance of antecedent conditions, 146–148  
 natural theology, 72, 84  
 naturalism, 149  
 metaphysical, 163  
 methodological, 163–164  
 nematodes, 154  
 neurofibromatosis type 1, 91  
 Newton, Isaac, 45, 84  
 niches, 75, 78, 136
- Old-Earth Creationists, xvi  
 ontogeny, 56  
*Origin of Species*, 70  
 events leading to the publication of, 81–85  
 reviews, 85–89  
 Owen, Richard, 87–89
- Paley's divine designer argument, 23–24, 26  
 Darwin's view of, 70, 79  
 vs. Dawkins' blind watchmaker argument, 27–28
- parallelism, 109–110  
 parapatric speciation, 135  
 perfect adaptation, 74, 76, 78–80  
 Pew Research Center, 2  
 evolution surveys, 11–17  
 phenological isolation, 137  
 phenotypes, 119, 137  
 phylogenetic trees, 94  
 plasticity, 56, 137  
 pleiotropy, 125  
 plesiomorphies, 101–102  
 polyphenism, 137  
 Prader–Willi syndrome, 91  
 prayer, 162–163  
 preconceptions, 42  
 principle of divergence, 74–75, 78

## 192 INDEX

- prokaryotes, 96–98, 133  
 protostomes, 120  
 psychological essentialism, 45, 53–62  
   conceptual change and, 64–65  
 Ptolemy, Claudius, 44  
 public opinion polls  
   conceptual issues, 3, 6  
   findings from Europe, 4–7  
   findings from USA, 10–17  
   global-level findings, 4, 17–22  
   inferential issues, 3–4  
   methodological issues, 2–3  
 punctualism, 142  
 punctuated equilibrium, 142  
 purpose-based explanations, 25–26
- radiometric dating, 133  
 randomness in evolution, 131  
 red–green color blindness, 91  
 relatedness, 92–95, 99, 112  
 relative adaptation, 76, 78, 80  
 religiosity, 32–34, 39, 168  
 repatterning. *See* developmental  
   repatterning  
 reproductive isolation, 136  
 ring species, 137, 156  
 robustness, 56  
 Rosenberg, Alex, 159  
 rRNA, 90  
 Ruse, Michael, 170
- sameness, 99  
 sampling, 129–130  
 science  
   features of the nature of, 152  
   misunderstandings of the nature of,  
   150–151  
   relationship with religion, 149–150,  
   165–168  
 scientific theory, virtues of good, 153  
 scientific understanding, theory of,  
   152–153
- scientism, 158–161  
 Sebright, John, 72  
 selection for a character, 121–124  
 selection of a character, 124–127  
 selection teleology, 49, 66–68  
 Shubin, Neil, 155–156  
 Smith, Adam, 75, 83  
 special creation, 76–77, 80  
 speciation, 135–139  
 species  
   definition of, xv  
   geographic distribution of, 76–78  
 species selection, 140  
 Spencer, Herbert, 126  
 stasis, 138, 142  
 stochastic processes, 127–133, 174  
   molecular level, 127–129  
   organismal level, 129  
   population level, 129–131  
 struggle for existence, 72–74,  
   78, 83  
 supernaturalism, 149, 170  
 survival of the fittest, 126  
 symbiogenesis, 97  
 sympatric speciation, 135, 137  
 sympatry  
   mosaic, 135  
   pure, 135, 137  
 symplesiomorphies, 102  
 synapomorphies, 102
- taxon, 94  
 taxonomy, 55  
 teleology (teleological explanations), 25,  
   *See also* design teleology; selection  
   teleology  
   for artifacts and organisms, 46–53  
 theistic evolution, 3, 10–11, 15–16  
 theodicy, 30  
*Tiktaalik*, 102, 155–156  
 transmutation, 70, 72, 75–77, 79–80, 83,  
   85

- tree of life, 74–75, 83, 98  
true causes (*verae causae*), 74
- unnatural death, 30–31
- variation, 62, 78–79, 82, 116, 126–127  
  in populations, 146–147  
  within-group, 64  
*Vestiges of the Natural History of  
  Creation*, 82
- Wallace, Alfred Russel, 82–83, 85  
Wedgewood, Emma, 81  
whales, 68, 110, 118  
Whewell, William, 74, 84, 88  
Wilberforce, Samuel, 86–89  
Wilkinson, John, 72
- Young-Earth Creationists, xv