I'm not robot

reCAPTCHA

Continue

Evolutionary biology definition examples

First published on P Aug 25, 2017 Evolution is a contemporary report on biology typically refers to the changes in rates of biological types in the population over time (see the entries in Evolutionary Thought Before Darwin and Darwin: The Origin of Species in the Descent of Man in the Earlier Meaning). Since evolution is too big a topic to address thoroughly in one entry, the primary purpose of this post is to serve as a broad overview of contemporary issues with evolution links to other entries where deeper discussion can be found. The entry begins with a brief assessment of the definitions of evolution, followed by discussion of different ways of evolution and related philosophical questions, and ends with a summary of other themes of evolutionary philosophy, with a particular focus on topics covered by the encyclopedia. The definition of evolution given at the beginning is very general; there are also more specific ones in the literature, some of which do not fit this general description. Here's a sample. Although charles darwin's work (see entry on Darwinism) is usually the starting point for contemporary understanding of evolution, interestingly he doesn't use the term in the first edition of On the Origin of Species, instead with the descent modification. In the early 20th century, modern synthesis gave birth to population genetics, which provided the mathematization of Darwinian evolutionary theory in light of Mendelian genetics (see also evolutionary genetics entry). This evolution has brought widespread, perhaps the most widespread, understanding, as a change in the frequency of alleals within the population from one generation to the next. However, it should be noted that this definition refers to evolution only in a microevolutionary environment and thus does not refer to the appearance of new species (and their new characteristics), although it serves as the basis for these macroevolutionary changes. In a popular textbook, Douglas Futuyma gives a more extensive definition: [biological evolution] is a change in the properties of groups of organisms over the course of generations... it covers everything from small changes in the proportion of different forms of gene within the population, from the earliest organisms to dinosaurs, bees, oaks and humans. (2005: 2) It should also be noted that the definition of Futuyma, contrary to the definition of population genetics, is not limited to changes in alleals; John Endler's definition is similar in this regard: Evolution can be defined as a guide to any net change in direction, or an cumulative change in the characteristics of organisms or populations over several generations, in other words, by modifying subsidence... It explicitly includes the origin and propagation of alleals, variants, characteristic values, or character states. (Endler 1986: 5) But even this definition is not extensive enough; molecular evolution at the heart of molecular changes macromolecules like DNA and RNA. Leigh van Valen described evolution in a very different sense as a control of evolution by ecology (1973, 488); this forescores those who emphasize the importance of development in evolution, including evo-devo supporters (see entry on developmental biology). Today, some have called for expanded evolutionary synthesis in light of other recent findings in developmental biology and evolutionary biology. Although this entry focuses on biological evolution, philosophers and biologists have sought to extend evolutionary ideas to the cultural realm. Part of the study of cultural evolution is to find out how and if the definition of evolution should be extended to this realm. Despite the diversity of definitions, there has been very little philosophical analysis of the term evolution. This deficit is in stark contrast to the extensive literature of the philosophy of evolution; In fact, for a long time, the philosophy of biology was almost entirely focused on evolution. Fortunately, that is no longer the case, with philosophers turning their attention to issues of genetics, molecular biology, ecology, developmental biology, and so on. It may be, as Theodosius Dobzhansky famously said, that nothing makes sense in biology except in the light of evolution (1973: 125), but much of biology is not evolutionary biology. Yet, though, philosophy of evolution remains a growing and vibrant area of philosophy in biology. 2. The ways of evolution It is essential to understand that biologists recognize many ways that evolution can occur, evolution by natural selection is only one of them, although it is often considered the most widespread. Evolution can also occur through genetic drift, mutation or migration. It can also occur in sexual selection, which some consider to be a form of natural selection and others believe to be different from natural selection (the latter was Darwin's 1859, 1874 view). Evolutionary theory can therefore be considered a study of these and other methods of evolution (including, but not limited to, mathematical models). To see why it makes sense to think of multiple ways of evolution, reconsider one of the definitions of evolution presented above, where evolution is interpreted as a change in the frequency of alleals within the population from one generation to another. With natural selection, the frequency of allelees that confer greater fitness tends to increase against those that provide less fitness. Sexual selection would be the same, but fitness is strictly understandable in terms of mating ability. Genetic drift, a form of evolution that involves chance (see entry in the genetic drift explanation), cannot be increased by the frequency of alleals that have greater fitness, an increase in the frequency of alleals that have lower fitness, or an increase in the frequency of alleals that are neutral. If organisms migrate from one population to another, it is likely that the frequency of allees in both populations will change. And if there is a mutation from one allere to another, then the frequency of alle gels in the population also changes, albeit in small amounts. Distinguishing these different ways of evolution allows biologists to track different factors that are relevant to evolutionary changes in the population. A careful reader may have noted that the previous paragraph referred to a probabilistic language: what usually happens, what can happen, what is likely to happen. Moreover, mathematical evolutionary models today (see the entry of population genetics) are typically statistical models. This fact of evolutionary models has given rise to a debate about evolution's philosophy about whether natural selection and genetic drift should be understood as the causes of evolution, as most biologists imagine them, or mere statistical summaries of lower-level causes: births, deaths, etc. (Natural selection and genetic drift entries give more information about this debate). This is why this entry uses the term more neutral ways of development, so as not to beg on issues that are pathogen-resistant and debated between the statistical actor. While there is widespread consensus that there are several ways of evolution, many contemporary work in the field of biology and biology philosophy has focused on natural selection. Whether this focus is a good thing or not is partly what the discussion of adaptation is all about. As a matter of fact, do we have reason to believe that natural selection is the most preva spread or most important method of evolution? Should scientific methods be aimed at testing natural selection hypotheses or different possible evolutionary methods? The emphasis on natural selection has also led to a great literature on the concept of fitness, given that population genetics definitions and other definitions of natural selection typically refer to fitness; natural selection explains why X was more successful than Y to rely on X for higher fitness. What fitness means, what organizations it refers to (genes, organizations, groups, individuals, types), what probabilities, if any, and how to calculate, are all under philosophical debate. There is also a great literature conceptually and empirically distinguishes natural selection from genetic drift. Migration, mutation (as a way of evolution), and sexual selection received less attention from philosophers in biology. 3. Other themes of evolutionary philosophy Some of the work in the philosophy of evolution deals with controversial issues. Of course, there is the debate on creationism. The vast majority of philosophers agree that creationism has significantly less evidence of than for the benefit of evolution. They also agree that creationism does not have to be they teach in a public school science classroom, but sometimes disagree with the reasons. For example, is it because you fail some of the criteria of science? If so, what are the criteria? Or the lack of evidence? Or is it because of religious grounds? Debates about sociobiology and evolutionary psychology areas that are designed to explain human behavior and psychology as advanced characteristics have stirred debate over the scientific state. Proponents have also been accused of excessive and uncritical adaptism and resting on sexist or other problematic biases (the latter, see the entry into feminist philosophy of biology). Another link between the philosophy of evolution is mindlessness and heritability. Although not explicitly emphasized by the evolutionary definitions given above, evolution is generally considered to be inherited changes, i.e. characteristics that can be passed on from generation to generation. But there has been some discussion about which organisms can be properly said to be heritable. Genes are indisputable, but are considered too limited by some who consider phenomena such as learning and cultural transmission, epigenetic heritage, and ecological heritage to be herifers as well. The term heritability can also cause confusion, as it is a technical term in evolutionary theory, and understanding the term and its consequences is not trivial. In classical terms, mindlessness is thought of as genotype/phenotype discrimination, genotypes are considered to be anaethes and phenotypes are not considered herto-like. But accepting this distinction seems to accept the difference between innate and acquired characteristics, and this distinction has been challenged, or at least turned out to be more complicated than it seems at first glance. Mindlessness also raises questions about biological information – do genotypes transmit the information and, if so, in what sense? In connection with this, in order for mindlessness to be part of evolution, it is necessary to specify entities, or at least reproduction (the former is a special case of the latter, which involves copying). In order to provide a more general theory of evolution, many authors will talk about replicators (or reproducers) and vehicles (or interactors) rather than the more limited and specific terms genes and organisms. With these terms in hand, one can more easily begin to discuss (like many) issues with units and selection levels: does selection occur at the level of the gene, the body, the group, the species, or all of the above? These selection units (replicators/multiples or vehicles/operators) are often considered to be biological individuals (see entry on the biological concept of the individual) as a necessary condition to select the selection units at all. Interestingly, another important area where biological ness played a big role is the debates debates Species. It is that many philosophers of biology claim that species are properly interpreted by individuals. Species, often referred to as evolutionary units - groups of organisms that develop in a uniform way - are rarely considered selection units. In Elisabeth Lloyd's terminology (see entry on units and level of selection), this is probably because species are rarely considered replicators/multitudes or vehicles/inter-actors, but are generally considered beneficiaries of the evolution of natural selection. In addition to sorting out whether species are individual and what units of evolution (if any) may be, there are decades worth of papers trying to characterize the concept of species to interracial, morphology, morphology, ecology, or some other characteristics. Here, as in many other areas of biology philosophy, they argued for a pluralistic approach. Another area of discussion is evolutionary game theory – the application of mathematical theory of games to biological and other evolutionary contexts. It provided a source of supposed explanations of human and other behaviors; evolutionary psychology, mentioned above, is one area that often makes use of the game theory approach. Among the more challenging behaviors that evolutionary game theory sought to explain is altruism. With altruism, we ask questions again about the level of selection (organisms or groups) because you have questions about which organisms are beneficial or harmful. Thanks to Melinda Bonnie Fagan and Jim Tabery for helpful comments. Comments.