

UNDERSTANDING THE TIMES

BIOLOGY QUESTIONS

BIOLOGY 4.1

1. What are some problems with the theory of theistic evolution?

The first problem with theistic evolution is that it is based on a bad interpretation of the Scripture. This method of bringing about life, especially mankind, seems cruel. Also, theistic evolution is particularly damaging to your view of Adam and Eve. If this account refers only to metaphoric or mythological characters, then it is hard to account for original sin and our need for Christ. Fourth, the theory of evolution in general is undergoing serious challenges from within the scientific community itself.

2. What aspects of the Christian worldview were foundational to the development of science?

Science is based on the assumption that the universe is orderly and can be expected to act according to specific and discoverable laws, a viewpoint that is tied directly to a Christian worldview. An ordered lawful universe would seem to be the effect of an intelligent cause, which was precisely the belief of most early scientists.

3. Define the following topics: teleology, DNA, spontaneous generation, Second Law of Thermodynamics, and gene pool. How do they relate to the debate over origins?

- **Teleology**—the study of purpose and design. Science continually reveals the complexity of the various forms of life. Life in general operates like the most complex of machines, i.e. it seems to have been designed to perform particular complex purposes.
- **DNA**—the storehouse containing all the genetic information necessary for life. DNA is a crucial part of all living matter, yet evolutionary theory is powerless to explain how it came into existence, let alone and why DNA evinces such phenomenal design.
- **Spontaneous Generation**—the belief that non-life gave rise to living organisms. In order for life to have arisen due to random processes, non-living matter must have come alive at some point in time. It is the burden of the Darwinist to propose a rational theory for how this event could have occurred.
- **Second Law of Thermodynamics**—scientific theory that states that although the total energy in the cosmos remains constant, the amount of energy available to do useful work is always decreasing. While the evolutionist calls for living organisms to grow more orderly as evolution progresses, the second law of thermodynamics assures us that order tends to disintegrate into disorder.
- **Gene Pool**—the total genes of species. Evolutionists believe that no breeding limits exist within a gene pool because life forms must ultimately be able to break their “species barriers” to yield new species. Evolutionists have thus proposed that beneficial mutations are capable of breaking any barriers to change. However, evolutionists have not been able to demonstrate that mutations are capable of breaking these limits.

4. According to Walter Brown, what should we see in the fossil record if evolution is true?

Brown makes the point that if the theory of evolution were true, then the fossil record should show continuous and gradual changes from the simplest (at bottom geological layers) to the most complex forms of life (at the top geological layers). However, what scientists actually find are gaps and discontinuities that appear throughout the fossil record, with both simple and complex forms of life found at both the bottom and the top layers—often without any forms of life in between that could pass as “transitional.”

5. What problems does the theory of punctuated equilibrium avoid? What problems must it face?

Although the theory of punctuated equilibrium is able to avoid the problem of transitional forms, it still must be able to account for the problems of spontaneous generation, a lack of observed beneficial mutations, and the contradiction of the second law of thermodynamics.

B I O L O G Y 4 . 2

6. What is the Islamic view of creation?

According to Islam, God has always existed. He is eternal and self-existent. He created everything and set the universe in order.

7. According to Islam, how many days did creation take?

In some passages, creation is said to have taken six days in others, the length of creation is given as eight days.

8. According to Islam, did creation happen in literal days or longer periods of time?

Just as the Christian community is divided over whether to advocate an old or young earth, so Muslims are also divided on this subject. While many traditional Muslims take the reference to days literally, some contemporary Muslim spokesmen hold that the days of creation were long periods of time (though they do not normally advocate evolutionary theories).

9. Do Muslims believe that the universe displays design?

The Qur'an describes the universe as finely ordered and illustrating God's magnificent mind in its design. Just like Christian apologists, Muslim apologists regularly appeal to the order of the universe as evidence for God's existence and creative activity.

10. Does Islam incorporate a belief in evolution?

Though some modern Muslims believe that evolutionary theories accurately describe the history of the world and the origin of species, the majority of Muslims reject evolutionary theories on both religious and scientific grounds.

B I O L O G Y 4 . 3

11. What do the Humanist Manifestos I and II state about humanity's origins?

The *Humanist Manifesto I* states, "Humanism believes that man is a part of nature and that he has emerged as the result of a continuous process."

This belief is echoed in the *Humanist Manifesto II*, which claims: "science affirms that the human species is an emergence from natural evolutionary forces."

12. Why must "modern" science rule out creation? Does this reasoning pose a problem for evolution as well? Why or why not?

"Modern" science studies and theorizes only about things that can be observed and measured. This naturalistic restriction necessarily rules out the existence of the supernatural because the supernatural cannot lie beyond the natural world. It should be noted that by modern science's strict definition, it cannot consistently render judgment on the theory of evolution, because it can neither be measured nor observed. One-time-only historical events fall outside the parameters of the scientific method.

13. What is spontaneous generation? Why is this theory important to evolutionists?

Spontaneous generation is the evolutionary theory that life arose spontaneously from non-living matter by natural, random processes. Without this concept, Humanism would have to postulate a supernatural force to explain the existence of the first form of life. This, however, would contradict Secular Humanism's atheistic belief system.

14. Define the following topics: natural selection and struggle for existence (or survival). How do they relate to the debate over origins?

- **Natural Selection**—The mechanism proposed by Darwin that naturally "selects" an organism's favorable characteristics and eliminates unfavorable ones through competition, predators, geography, time, etc.
- **Struggle for Existence**—Inherent in the idea of natural selection is the notion that those life forms best equipped to survive will win the struggle for existence. This allegedly explains why life forms have become better equipped to survive over time.
- **Mutation**—Evolutionists theorize that genetic mutations are responsible for introducing characteristics into a species, thus making it more fit to survive. Combining mutations with the

theory of natural selection provides the means and mechanism for adaptation and evolution.

15. Upon what six planks does Secular Humanist biology rest?

Secular Humanist biology rests on the theory of evolution which is comprised of 1) spontaneous generation, 2) natural selection, 3) struggle for existence, 4) beneficial mutations, 5) adaptations, and 6) the fossil record.

B I O L O G Y 4 . 4

16. Why was Charles Darwin's work so important to Karl Marx? What connection does Friedrich Engels make between Darwin and Marx?

Marx and Engels were among those who recognized the usefulness of Darwin's theory as a foundation for an entirely materialistic perspective on life. In a letter to Engels, Marx writes, "During . . . the past four weeks I have read all sorts of things. Among others Darwin's work on Natural Selection. And though it is written in the crude English style, this is the book which contains the basis in natural science for our view." Engels makes the same claim even more straightforwardly: "Just as Darwin discovered the law of evolution in organic nature, so Marx discovered the law of evolution in human history."

17. Where did Engels place his faith and was there any way to persuade Engels against spontaneous generation?

Louis Pasteur was able to disprove the theory of spontaneous generation, but apparently not to Engels' satisfaction. Although no proof could be found for spontaneous generation, and no rebuttal could be offered against Pasteur's finding, Engels still supported this theory wholeheartedly. In other words, Engels placed his faith in the possibility of spontaneous generation—disregarding whether it was scientific or not.

18. Why do Marxists ultimately deem Darwinism as inconsistent with their worldview?

When examined closely, Darwinian evolution of gradual change from species to species actually works contrary to the Marxist dialectic. According to dialectical materialism, whenever thesis and antithesis clash, the new synthesis created occurs rapidly, in the form of a jump, rather than in the form of a long, gradual process. Therefore, the theories of traditional and neo-Darwinism were eventually dropped by most Marxists and replaced by the theory of punctuated evolution.

19. What form of evolution does Marxism embrace?

Marxists expect evolution to work according to the dialectic—when thesis (a species) and antithesis

(some aspect of the environment) clash, the synthesis (a new species) occurs rapidly. In 1972, the theory of punctuated equilibrium (or punctuated evolution) arose because it aligned with the dialectical process more closely than did Darwinian evolution. Punctuated evolution postulates that evolution worked itself out in periods of “punctuated” or speedy change, followed by periods of “equilibrium” or stasis. In the end, this theory contains room for jumps, rapid change, and chance and it is most consistent with the philosophy of dialectical materialism and the spirit of revolution within evolution.

20. What stunning indictment does Stephen J. Gould make against the fossil record? How does this relate to his theory of punctuated evolution?

Gould observed that the “[s]tasis, or nonchange, of most fossil species during their lengthy geological lifespans was tacitly acknowledged by all paleontologists, but almost never studied explicitly because the prevailing theory treated stasis as uninteresting nonevidence for nonevolution . . . The overwhelming prevalence of stasis became an embarrassing feature of the fossil record, best left ignored as a manifestation of nothing (that is, nonevolution).” In other words Gould is admitting that the fossil record reveals a problem for the traditional and neo-Darwinian theories of evolution. Unable to fully relinquish the general theory of evolution, Gould suggested that slow and gradual change within a species is not supported by the fossil record simply because evolution is not slow and gradual. Rather, Gould (and Eldridge) theorize that the species remains relatively the same for long periods of time and then undergoes periods of relatively speedy change. Thus, scientists find numerous fossils, but few transitional forms.

B I O L O G Y 4 . 5

21. What is the main evolutionary concern for Cosmic Humanists? What is this approach called?

Cosmic Humanists believe that mankind is moving upward toward an age of higher consciousness. Because everything is ultimately energy, Cosmic Humanists believe that mankind will one day achieve unity with all of humanity and everything else, a kind of “collective consciousness.” Not everyone in the world must embrace the New Age movement before it can become a reality—dedicated Cosmic Humanists can simply act as the catalyst for an evolutionary leap into utopia. This approach is called “Cosmic Evolution.”

22. How do Cosmic Humanists view science? In what ways do they believe it has been harmful? Do they believe science supports their ideas about reality?

Cosmic Humanists believe the traditional view of science—learning to control the laws of nature—has led to an assault on the balance of planetary harmony. Many Cosmic Humanists believe the scientific revolution that developed during the 1600s was responsible for the rape of the planet. They believe the new science of quantum mechanics (which is strictly theoretical and based on questionable theories) and other scientific discoveries support their pantheistic theology and non-naturalistic philosophy.

23. How does the evolutionary view of Cosmic Humanism differ from the evolutionary theory purported by Marxists-Leninists and Secular Humanists?

Secular Humanists and Marxist/Leninists both believe that evolution is helping humanity progress toward a higher form of biological being. Cosmic Humanists, on the other hand, believe that evolution is helping humanity progress toward a higher consciousness or “New Age.” The “science” of evolution provides the guarantee that all humanity will one day achieve this divine consciousness.

24. How is John White’s version of the Second Coming different from the one described in the New Testament?

For White, Christ’s final appearance will not be the moment when all people bow down to acknowledge the Lordship and sovereignty of Christ: “The final appearance of the Christ will be an evolutionary event. It will be the disappearance of egocentric, subhuman man and the ascension of God-centered Man. A new race, a new species, will inhabit the Earth—people who collectively have the stature of consciousness that Jesus had.”

25. What is the *Gaia Hypothesis*? How does this hypothesis undermine the Darwinian ideal of survival of the fittest?

The *Gaia Hypothesis* proposes that taken as a whole, Earth behaves not as an inanimate sphere of rock and soil, but more as a biological organism that adjusts and regulates itself.

Instead of competition and struggle for survival, the Gaia Hypothesis emphasizes the cooperative spirit of the entire biosphere. Lovelock suggested that the earth was not a “dead” habitat that happens to support life, but is itself a living, integrated system of soil, oceans, wind, and living things interacting together in harmony for the good of the whole. In addition, it runs counter to Darwinian evolution, which insists that life is a result of chance, not purpose.

B I O L O G Y 4 . 6

26. What are three prominent theories of evolution? Why are many Postmodernists unwilling to endorse any particular theory of origins?

1. **Classical Darwinism**—the gradual process of change by natural selection
2. **Neo-Darwinism** (proposed in the 1930s)—Darwin’s theory of natural selection combined with change generated by genetic mutation.
3. **Punctuated evolution/equilibrium** (proposed in the 1970s)—the theory that changes happen abruptly (geologically speaking) and are usually followed by longer periods of stasis. These abrupt changes are believed to occur in small isolated populations.

Each of these three theories of evolution is a metanarrative describing *how reality actually is* and *how life ultimately developed*. In general, Postmodernists are against promoting any overarching explanations of reality, or for that matter, origins.

This is precisely why Postmodernists at Boston University told the Nobel Prize winning evolutionist

Steven Weinberg that evolution was merely his metanarrative, “[e]volution is merely a social construct, like every other schema—a creation of the human mind.”

27. What is Paul Feyerabend’s opinion of how science works?

Feyerabend makes a number of points regarding the operation of scientific investigation and discovery:

- Many scientific “truths” accepted are eventually discarded
- Data is never neutral; but will always be colored by the biases and agendas of scientists
- Scientists usually work with unproven assumptions and filter data through their preconceived ideas
- Theories are regularly tweaked and constantly evolving
- The scientific establishment is itself very politicized

The title of Feyerabend’s essay is, “Anything Goes.” Feyerabend doubts that anything decisive can be known definitively through science. He argues that science is not really knowledge at all.

28. How does Thomas Kuhn describe the nature of scientific investigation?

Kuhn points out that science is not merely a progressive, incremental discipline that studies and records facts. Scientific “facts” can be understood and interpreted in a variety of ways depending on the worldview assumptions of the scientist.

Kuhn is also famous for pointing out how scientific theories lose favor. That is, theories don’t usually die out because they are disproved; rather older theories usually die out with their proponents while new theories attract the attention of younger scientists, who promote these theories over the older ones. Current scientific theories are just that—*current* theories. Eventually the theories popular today will be replaced by more popular theories in the future.

29. What do evolutionary Postmodernists believe about man’s role in the process of evolution?

Unlike much of the earlier modernist Darwinists, Postmodernists who hold to evolution assert that the process did not “have man in mind.” Humanity is not special nor can we claim that we are continually progressing in our evolution. In fact, Gould argues that homo sapiens are somewhat insignificant when compared with species such as bacteria, which “are—and always have been—the dominant form of life on Earth.”

30. Although Christians acknowledge that scientists have biases and presuppositions, what reasons are given for believing that true knowledge about reality is possible?

To a degree, Christians can agree with Postmodernists: science is not the only source of knowledge, scientists do have biases and agendas, and scientific “truth” does seem to change with the shifting

wind. However, unlike Postmodernists, Christians cannot deny that knowledge of the world is impossible since we believe God has provided us with a source of knowledge in Scripture. Likewise, it seems logical that we can gain at least some basic knowledge of the world which he created:

- Moreland—“Science (at least as most scientists and philosophers understand it) assumes that the universe is intelligible and not capricious, that the mind and senses inform us about reality, that mathematics and language can be applied to the world, that knowledge is possible, that there is a uniformity in nature that justifies inductive inferences from the past to the future and from examined cases of, say, electrons, to unexamined cases, and so forth.”
- Kurtz insists that rejecting objectivity is a mistake: “We think it profoundly mistaken because science does offer reasonably objective standards for judging its truth claims. Indeed, science has become a universal language, speaking to all men and women no matter what their cultural backgrounds.”
- Campbell—“The methods used in the sciences have produced powerful explanations about how things work and innumerable useful applications, including technology even its harshest critics would never be without.”

“ICONS OF EVOLUTION”

VIDEO QUESTIONS

1. How do Haeckel’s drawings seem to support Darwin’s theory?

One element required to prove the theory of evolution was to show a path of common descent. Darwin believed that he found this proof within the similarity of the earliest stages of life. Darwin, theorizing that organisms evolved over time from other organisms, believed that classes of animals within a particular phylum would be similar at the embryonic stage of development. He further theorized that it was only as these organisms developed that they began to look relatively dissimilar. The proposed similarity within a phylum of embryos was thought to demonstrate a common ancestry for organisms within a particular class.

This supposed similarity within the embryos of a particular class is precisely what Haeckel’s drawings seem to empirically indicate. Haeckel drew the stages of development for species which fell under the class of vertebrates such as fish, salamanders, turtles, chickens, and various mammals. All looked incredibly similar at the earliest stages of development, thus giving some reasonable proof to Darwin’s conjecture about development from a common ancestor some.

2. What was the problem with Haeckel’s drawings?

Haeckel’s drawings were published in the 1860s; however, soon after, his colleagues began to call the evidence into question. First, it turns out that Haeckel distorted the images of the embryos at the earliest stages of development to make them look more similar. Second, he only included embryos that would help Darwin’s theory. For example, to represent amphibians he used a salamander rather than a frog, which would have looked quite different. Third, Haeckel was selective in Darwin’s favor when he ignored two of the seven classes of vertebrates: jawless fish (such as the lamprey) and fish with cartilaginous skeletons (such as the shark). Finally, he omitted the embryos’ earliest stages all together. Embryonic development actually starts out looking very dissimilar; midway through

development looks vaguely similar, and then finally differs again in the adult stage.

3. Why is the change in a finch's average beak size a good example of natural selection?

During times of drought, the population of finches on the Galapagos Islands declined drastically over a relatively short period of time. The reason for this phenomenon was that the only food available for the finches was large, thick seeds. The birds that died out were the birds with the smallest (and thus weakest) beaks. The few that survived were those with the largest (and thus strongest) beaks. These surviving birds then reproduced offspring with similar sized beaks. These finches in turn were equally able to crack tough seeds and survived to produce similar offspring. This real life illustration demonstrates what most would call "natural selection" or the weeding out of the weakest animals in the competition for resources.

4. What evidence do the Galapagos finches supply for macro-evolution?

The theory of evolution (particularly macro-evolution) states that micro-changes can, over time, accumulate into macro-changes, i.e. natural selection has the ability to build new species. Darwin's finches demonstrate the ability of natural selection to produce micro-changes within a species; however, these birds do not support the grander story of macro-evolution. The finches on the Galapagos never actually netted any change, their average beak size merely oscillated back and forth with the changing of the food supply. In this example, no new species ever emerged. There was (and is) merely fluctuation within a kind.

5. What is neo-Darwinism?

Darwin's original theory of evolution rested on the belief that natural selection could favor an organism with positive traits (or traits that help it survive) and could exclude an organism with negative traits (or traits that hinder its survival). According to traditional Darwinism, these traits arose from small inheritable variations within a species, e.g. the Galapagos finches. Therefore, according to traditional Darwinism, favorable traits arise from small variations in the heredity of a species and natural selection acts as the selecting agent to preserve these favorable traits.

Neo-Darwinism, however, expanded Darwin's theory to include the occurrence of random genetic mutation. Thus, the ability to evolve need not rest on heredity alone; it could instead be sped up by accidental, yet favorable, molecular changes.

6. What evidence does the four-winged fruit fly supply for neo-Darwinism?

Neo-Darwinists hold up the four-winged fruit fly as an example of a favorable random genetic mutation. The problem with the four-winged fruit fly, however, is that its extra set of wings is not actually a favorable attribute. Its extra set of wings is a hindrance to the fruit fly's survival since these additional wings do not function. The anomaly of the four-winged fruit fly can only survive in the laboratory, and in nature it would be selected out. The four-winged fruit fly is actually a bad example of neo-Darwinism because the mutation is less than desirable.

7. How can antibiotic resistance be demonstrated in the laboratory? What is the fitness cost?

Antibiotics are chemicals that are produced by microorganisms, and that inhibit or kill the growth of other microorganisms such as bacteria. When an antibiotic is exposed to a Petri dish of bacteria colonies, the bacteria colonies usually die. However, this is not always the case. Sometimes bacteria strains survive. The phenomenon is called “antibiotic resistance.”

These bacteria are resistant to antibiotics before the antibiotics are ever introduced to the colony of bacteria. Either the colony’s cells are already encoded with antibiotic resistant enzymes or they arose earlier by accident from a DNA mutation. At first, these antibiotic resistant mutations seem beneficial, but since they alter essential molecules inside the cells, they can also be harmful. Absent the antibiotics, these resistant bacteria colonies cannot compete with the non-resistant bacteria colonies. In a short period of time they will die. This trade off is known as “fitness cost.”

8. What evidence do antibiotic resistant bacteria provide for neo-Darwinism?

According to neo-Darwinism, DNA mutations provide raw material for evolution because they add variations to the process of descent with modification. However, in order for DNA mutations to be favored by natural selection, they must benefit the organism. In this case it does, at least in the short run. Yet this represents only a minor change within an existing species; and since the change is reversed when conditions return to normal, antibiotic resistance is at best an example of microevolution like the oscillating change in the average beak size of the finches of the Galapagos Islands. A new species of bacteria has never arisen from processes of mutation and natural selection.

9. What is homology? Does the Darwinian theory of homology fit the available evidence?

Homology is the study of similarities in patterns of bones or structures of differing organisms. After Darwin, homology was redefined to mean similarity due to common ancestry. Darwin argued that the best explanation for homology was the biological descent with modification from a common archetype. Most scientists before Darwin (and those that today doubt Darwin) see such similarities as a plan in the mind of a Creator—not an ancient archetype, but a model.

This could be compared to the manufacturing of automobiles. The 1953 and 1954 Corvette are different, yet very similar. Likewise, the 1955 model and the 1956 are also similar yet different. The reason for these similarities is that the manufacturers of all models had an archetype in mind. That They used similar concepts.

Neo-Darwinists have suggested that two mechanisms can account for homologous structures: similar development pathways and similar genes. However, there are instances of homologous structures that defy both proposed mechanisms. For example, homologous structures can be produced by different genes, as is the case with the body of the fruit fly and the wasp. Homologous structures can also follow different patterns of development, as is the case with the gut of the shark, lamprey, and frog.

10. What is the Cambrian explosion? How does it challenge evolution's "bottom-up" progression of life?

The Cambrian explosion is the relatively sudden appearance of numerous simple and complex animals between 520 and 530 million years ago. The most striking feature of this event is that it turns Darwin's "bottom-up" progression of life on its head, for Darwin proposed an evolution of life from a few simple life forms to many more complex life forms. However, the Cambrian explosion does not fit this model. From this event we can see the sudden appearance of very complicated life forms. Some Darwinists have proposed that conditions before the Cambrian period may not have been favorable for preserving fossils or that the organisms were too soft to be preserved. However, a number of pre-Cambrian fossils have been found, including very simple organisms like bacteria. Instead of branching gradually from an original life form in a tree-like pattern, the fossil record actually looks upside down.