

Re: Biochemistry of Genetic Mechanisms

Source: <http://sci.tech-archive.net/Archive/sci.bio.evolution/2005-08/msg00413.html>

- *From:* "yahooterry@xxxxxxxxxx" <terryhilleman@xxxxxxxxxx>
 - *Date:* Wed, 24 Aug 2005 00:36:19 -0400 (EDT)
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I will try to be more clear in communication. There are two processes involved in evolution. The first process is environmental selection (adverse environmental change) in a confined area; extinction is the most common result. Sometimes, the environmental selection process does not cause extinction; sometimes a second process involves a genome response that results in an adaptation which allows survival in the newly-created environment. I would envision the stem-loop action previously discussed as the mechanism of adaptation. This adaptation occurs as a biochemical process; however, selection (environmental and natural) for survival is at the organism level. There must be enough time to enable the genome response from stressful environmental conditions (in a confined environment). This genotype response requires genotype variation (that resulted from mutations) with the potential to produce a surviving phenotype. The survivors have the resultant genetic bias of natural selection (a change in gene frequencies in a population, owing to fitness of phenotypes' reproduction or survival among the variants).

This is the view expressed in my book (copyright 2005); this is something new and it is not a wordy rehash of the same ol' same ol....

RE: "I would put it like this. In order for NS to work, it is essential for there to be variation in genotypes. Whether there is variation (in time or space) in the environment is irrelevant. That is the standard viewpoint on "microevolution" (the source of adaptation) as I understand it. The standard viewpoint on "macroevolution" (speciation and increased complexity over time) does see an essential role for variation in the environment. But variation in genotypes is also necessary for macroevolution to work under NS."

I agree that there must be genotype variation (from mutation); this must enable a genome response from stressful environmental conditions in a confined environment. I would envision the stem-loop action we previously discussed as the mechanism of adaptation. I do not separate microevolution and macroevolution as you have. I would refer you to Levinton's discussion of this. Michael Behe caused confusion by separating micro and macro as he did, and to say that time and space environmental influence is irrelevant is also similar to his claim.

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Michael Behe, in Darwin's Black Box—The Biochemical Challenge to Evolution, insists that natural selection cannot account for the purposeful arrangement of parts that is seen at the molecular level. Behe uses a "black box" as a whimsical term for a device that does something, but whose inner workings are mysterious – sometimes because the workings can't be seen, and sometimes because they just aren't comprehensible. He suggests that Darwin just didn't understand what was in the black box of biochemistry, the intricate workings of life itself. He maintains that the workings of life essentially lie in the details of its complex molecular biochemical machinery. He believes Darwinian evolution, chance variation resulting in a competition advantage in the struggle for life, falls short in applications to the fine details of biochemistry. He firmly believes that the real work of life does not happen at the level of the whole animal, and that "natural selection working on random variation" breaks down at this most important molecular level. He further states that at this most important molecular level, anatomy and the fossil record are irrelevant. Still further black box analogy is made between mutation and evolution, indicating a lack of evidence of interaction between both.

Behe defines evolution "in the sense Darwin gave the word. (It) means the process whereby life arose from nonliving matter and subsequently developed entirely by natural means." Is this correct? It is helpful to return to the original work to understand what Darwin really said. Recall Darwin suggested that then present-day species (different types of life) resulted from a common ancestor and changes (anatomical adaptations via natural selection) occurring in each isolated population. This theory of natural selection (the preservation of favorable variations & the rejection of injurious variations), as the explanation for the origin of species (different types of life), seems to be less focused on the origin of life than on the evolution of changes from that time on. It would seem to me that anatomical changes and the fossil record would be essential to a comprehensive understanding of evolution; this comprehensive understanding should also include the biochemistry of anatomical structure and function. Recall that variation is packaged as combinations of traits within one individual organism. Expanding one trait may then be at the expense of other traits. To be beneficial, this new combination must enhance the overall survival chances of the individual and/or offspring. The most effective combination for the genetic variance of natural selection then becomes the most optimum balance of all traits. This places the selective process for complex life at a higher level than molecular chemistry, even though the whole is made from the sum of the parts.

Behe could maintain that the origin of life and some simple forms of life, for a period of around four billion years, function primarily at the molecular level. The origin of life is still unknown; the biochemical argument is inconclusive here. Simple forms of life, like a virus or bacteria do mutate at the molecular level, do evolve, and do

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seem to follow a pattern of natural selection (survival of the fittest). A virus undergoes mutation (genetic change), which enables it to invade new environments. Nevertheless, the selection process is still at the level of organism survival, not at the level of a chemical reaction. Bacteria develop biochemical-generated structural resistance to (an environment of) antibiotics, and pass this survival advantage on to their offspring. Again, selection is at the organism level, not at the level of the biochemical reaction itself. Isn't there molecular evolution involved in the biochemistry of the mutation allowing plants to develop resistance to an environment of herbicides, and pass this survival advantage on to their offspring? It is not the chemical reaction alone that survives; it only survives due to environmental selection at the level of the organism possessing the natural selection mutation advantage. Similar molecular processes occur when insects develop resistance to an environment of insecticides, and pass this survival advantage on to their offspring. Molecular-level change in the biochemistry of genetic mutation clearly produces natural selection advantage in organism-level survival. Aren't these clear interactions where random genetic variation is environmentally-selected for a natural-selection genetic bias? Hasn't this molecular process enhanced evolutionary survival value in a newly-created environment (that is unfriendly to existing life forms)? Nevertheless, Behe maintains that life is not accountable to natural selection at the pure molecular level. What of natural selection accountability at even more detailed, but even less appropriate, atomic or sub-atomic levels? Behe, like Aristotle, considered natural selection as a cause for the creation of different types of life and evolution; but, like Aristotle, dismissed it in favor of teleology. Behe believes that: "All of these things were designed because of the ordering of independent components to achieve some end." Teleology, a black box itself, is still alive and well.

Re: "My 'geo-Darwinism' can be described as a cause of extinction. But geo-Darwinism without the neo-Darwinistic change in the gene frequencies of populations is a fairly impotent force for change. So I have to ask: what does your "environmental selection" do that my "geo-Darwinism" doesn't do?"

Your "geo-Darwinianism" is involved as part of the selection process, but in my story, heredity (natural selection) and environment (environmental selection) get married and end up with the same last name.

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- *Follow-Ups:*
 - ◆ **Re: Biochemistry of Genetic Mechanisms**
 - ◇ *From: Perplexed in Peoria*

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- **References:**

- ◆ **Biochemistry of Genetic Mechanisms**
◇ From: yahooterry@xxxxxxxxxx

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