

Recent challenges to natural selection

Phil Gaskill and Brian Thomas

Scientists from three creation ministries met in 2010 to discuss potential inaccuracies with the way in which creationists have long represented natural selection, and to discuss the merits of possible alternative or additive explanations for trait variations in created kinds. The feedback was mixed. However, the challenges voiced at that meeting, and subsequently described by Randy Guliuzza in a series of articles in *Acts & Facts* magazine, caused the present authors to question the role of natural selection in biological phenomena. Specifically, rapid and repetitive phenotype changes in sticklebacks and salmonids are inconsistent with natural selection, which postulates gradual additive or deleterious changes. The changes instead appear to be directed from within the organism and repeated in response to environmental conditions. The rapid and repetitive nature of these changes argues for an organism-centred rather, than an environment-centred mechanism. Such a mechanism may better explain trait variations among many, and perhaps all, other organisms.

A unique meeting to discuss natural selection

On 8 December 2010, scientists from *Creation Ministries International*, *Answers in Genesis*, staff of the *Institute for Creation Research* (ICR), and a few others held an all-day meeting at the offices of the ICR in Dallas, Texas. ICR National Representative Dr Randy Guliuzza presented a strong argument against natural selection and suggested that a new paradigm should replace it.

He described how real, measurable examples of natural selection are lacking or absent in the literature, and argued that natural selection is a non-real construct; that it is incorrectly used to explain commonplace occurrences such as white rabbits in the arctic or bacterial resistance to antibiotics. He proposed that the real mechanisms for changes in traits within kinds are always organism-centred and not resident in the environment. He advocated the idea that organisms deploy variable heritable traits via biological designs for which the Creator, not nature, deserves credit.

The responses to this argument against natural selection were mixed, but most of the scientists at the meeting thought favourably about pursuing internal mechanisms of adaptation as the key factors in the organism–environment interface.

Since then, Guliuzza has published his ideas in more detail in a series of articles characterizing natural selection as ‘Darwin’s Sacred Imposter’ in *Acts & Facts* magazine.^{1–5} Some readers, including the present authors, have been challenged by these ideas, but have also found merit in the organism-centric approach to describing biological adaptation.

What’s wrong with natural selection?

We concur with Guliuzza that natural selection adequately explains none of the variations within a kind observed in the wild. Nature cannot ‘select’ since it is not volitional. There is no measurable force (usually referred to as ‘selection pressure’ or ‘selection coefficient’ in most of the literature with which we are familiar) located in nature which acts upon organisms to *cause* variations. Even most ardent Neo-Darwinists will admit that. Therefore, natural selection as a concept cannot give a causal explanation for variation. We suspect that natural

selection does not act as a passive filter on variations either, though this is a more complicated question that requires additional research to clarify.

Natural selection has also recently been criticized by creationist Jason Lisle, who rightly points out that the use of natural selection to explain fitness (i.e. the degree to which an organism is well-suited to its environment) is an example of reification and thus is a logical fallacy.⁶ Randy Guliuzza makes this point as well.² However, Dr Lisle seems to stop short of Guliuzza’s critique. First, Lisle insists that the concept of natural selection itself is valid, asserting that it is tautologically true and accepted by both evolutionists and creationists. Then he states that natural selection explains (i.e. provides a causal explanation for) the absence of organisms not suited to their environments. Thus, he appears to view natural selection as a passive filter, much as Henry Morris did. This still allows for the notion that nature has selective power.

Alternatives to natural selection

In contrast to natural selection, Guliuzza describes how organisms fit and fill various ecological niches via internal, not external, ‘powers’ of selection. His ‘programmed filling’ concept proposes that an organism’s biological mechanisms detect certain environmental cues and respond by passing those cues along to internal systems which process and react to that information by generating trait variations either within that organism or in succeeding generations.

Dr Todd Wood has proposed a model of trait-variation-to-environment fitting that could be considered a competitor to natural selection, called ‘mediated design’.⁷ Though the concepts of programmed filling and mediated design are quite similar, there are at least two subtle differences. Wood argues that organisms were originally created with a genetic toolbox containing multiple solutions to solve present and

Editorial note: The two referees appointed did not agree with the thrust of this paper, but thought that it could be published to stimulate thinking and discussion.

future environmental problems. These are largely in the form of genes that are present but not expressed. Once the organism encounters a change in environmental conditions, it ‘accesses’ the appropriate trait to solve the environmental problem. This is done by suppressing one set of genes and expressing another such that the appropriate trait is produced and the organism is thus able to successfully adapt. The organism is thus *reactive* to changes in the environment. It adapts by selecting appropriate traits to allow it to remain in, or survive in, its changing environment. If we understand Wood’s hypothesis correctly, God foreknew all of the environmental changes which organisms would encounter and equipped them with the ability to select the appropriate traits from a toolbox of *pre-programmed genes* to successfully survive in these environments.

Guliuza’s ideas regarding programmed filling are somewhat different. He argues that, in addition to Wood’s model, organisms can also express variable traits even before encountering environmental problems. The traits of one organism allow it to successfully move into one environment while the traits of another close relative allow it to successfully move into a different environment. Thus, the organism is *proactive* in adapting to new environments. It pioneers new environments instead of just remaining in, or surviving in, a changing environment. In addition, Guliuza’s hypothesis appears to be that organisms are not—or not just—equipped with a set of preprogrammed genes but are *preprogrammed with the ability to generate new traits*. In other words, organisms do not possess just a toolbox but also a cookbook and ingredients—the ability to recombine information to create new trait variations. Therefore, Wood’s hypothesis seems to imply a more limited set of tools from which the organism can select to solve environmental problems than does Guliuza’s hypothesis. Of course, Guliuza would also firmly assert that there are limits to the variability of heritable traits.

These differences are certainly subtle, but may prove to be important. The field of epigenetics, which deals with the differential expression of genes, is providing some fascinating insights in this area.⁸ A study of gene expression—along with a study of the internal mechanisms by which information in DNA is not only translated but also recombined—will

be instrumental in establishing whether mediated design, programmed filling, or a combination of both, is the best model for adaptation in created kinds.

Does nature select or do sticklebacks select trait variations?

The threespine stickleback fish is one example of an organism which appears to select its own trait variations. Threespine sticklebacks inhabit both salt and fresh water, and those living in salt water are much larger, have different colours and more armored scales than their freshwater counterparts. All of the threespine stickleback varieties can interbreed, and fresh, brackish, and marine varieties apparently redeploy the same set of adaptive traits, as stickleback populations move from one environment to another and back again.

A study recently published in *Nature* examined DNA from 22 representative stickleback fishes for sequence differences that might be linked to saltwater versus freshwater environments. The study authors found corresponding sites of variation, with a “higher concentration of conserved non-coding sequences in intergenic regions, probably reflecting a more complex regulatory architecture” interspersed among the 42 chromosomes.⁹ Also, many of the DNA differences between the two populations involved differences in genes or regulatory regions that affect the fish’s internal signaling mechanisms. For example, the authors described how a chromosomal inversion provided two different potassium channel genes—one version for the saltwater stickleback and the other version for the freshwater.

The *Nature* study authors credited ‘natural selection’ for the differences. However, natural selection was conspicuously absent from the study authors’ description of the actual mechanisms behind the biological changes. Ingenious biological design, not natural selection, is by far the more powerful explanation for the amazing adaptability of sticklebacks.

Are partially migratory salmonids resistant to natural selection?

Partially migratory species—those in which some members of the population migrate and other members of the same population do not—provide an opportunity to test the explanatory power of natural selection. Partial migration occurs across multiple animal taxa, and in both invertebrates and vertebrates. Migratory individuals often display phenotypic differences compared to resident individuals; such as size, colour, and osmoregulation in fish, and wing length in insects. Populations of the partially migratory salmonid species *Oncorhynchus mykiss*, for example, consist of a mixture of interbreeding anadromous steelhead—which migrate to the ocean before returning to spawn in fresh water—and resident rainbow trout. It has been widely speculated that wild steelhead are produced from both resident and anadromous parents, and this has been recently confirmed (Cramer Fish Sciences, unpublished data).

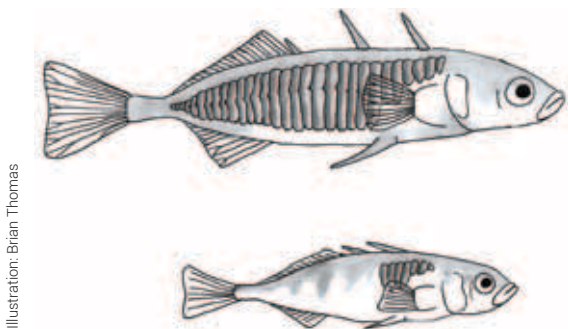


Illustration: Brian Thomas

Figure 1. Scale drawings of marine (top) and freshwater (bottom) sticklebacks, illustrating phenotypic differences. Dark, lateral areas indicate body armor composed of bony plates. The two morphologies arise from the same species.



Photo: Frank Thrower

Figure 2. Comparison of juvenile *O. mykiss* resident and anadromous forms. Resident (rainbow trout) on the left and anadromous (steelhead) on the right.

At least one recent study of *O. mykiss* has yielded results which challenge the explanatory power of natural selection. The study found that a significant number of migrating steelhead progeny could still be produced from a landlocked population of rainbow trout after 70 years and 20 generations.¹⁰ This surprised the study authors, who expected that the production of steelhead from this resident population would be “negligible after 70 years of complete counter-selection”. In other words, the population maintained the ability to produce both migratory and resident individuals despite what should have been a very high coefficient of selection against the migratory form. If natural selection was actually operating, why did it fail to remove the genes for migration? The study authors conclude that the “continued production of large numbers of smolts [young salmon] indicates that a suite of genes may be involved and/or environmental conditions are important for activation of smolting genes.” Of course, the activation of genes in response to a changed environment, coupled with the unexpected failure of natural selection to remove these genes from the population after a large number of generations, is a strong argument for *pre-existing programming*. Similar studies may go a long way toward validating or falsifying the concept of natural selection.

Rapid speciation is a challenge to natural selection

Evidence from all manner of organisms—bacteria to bulldogs—appears to indicate that many new species or traits can appear in as few as 1–3 generations.¹¹ This is difficult to explain in either the Darwinian or Neo-Darwinian concepts of natural selection, in which adaptation is a process by which nature selects small, favourable variations and slowly accumulates them to arrive at new functions and forms over long periods of time. Indeed, there is an increasing number of articles reporting the amazement of researchers regarding the incredibly rapid pace of ‘evolutionary’ change.¹² In contrast, the idea that new traits are generated rapidly is a straightforward consequence of an organism-centric approach such as programmed filling or mediated design.¹³

Conclusion

Given Guliuzza’s strong argument against the concept of natural selection, the ability of at least some organisms to regulate the expression of variable traits in response to environmental conditions, the ability of others to retain traits which should be selected against, and the astonishingly rapid pace of speciation, isn’t it time that creationists reconsider reliance on natural selection as an explanation for biological adaptation?

References

1. Guliuzza, R., Darwin’s sacred imposter: recognizing missed warning signs, *Acts & Facts* **40**(5):12–15, 2011.
2. Guliuzza, R., Darwin’s sacred imposter: how natural selection is given credit for design in nature, *Acts & Facts* **40**(7):12–15, 2011.
3. Guliuzza, R., Darwin’s sacred imposter: the illusion that natural selection operates on organisms, *Acts & Facts* **40**(9):12–15, 2011.
4. Guliuzza, R., Darwin’s sacred imposter: natural selection’s idolatrous trap, *Acts & Facts* **40**(11):12–15, 2011.
5. Guliuzza, R., Darwin’s sacred imposter: answering questions about the fallacy of natural selection, *Acts & Facts* **41**(2):12–15, 2012.
6. Lisle, J., Logical fallacies: the fallacy of reification, *Answers in Genesis*, posted on answersingenesis.org, 3 August 2009, accessed 20 April 2012.
7. Wood, T.C., Mediated design, *Acts & Facts* **32**(9), 2003.
8. Thomas, B., Epigenetics: more than evolution can handle, *ICR News*, posted on icr.org, 30 June 2009, accessed 26 April 2012.
9. Jones, F.C. *et al.*, The genomic basis of adaptive evolution in threespine sticklebacks, *Nature* **484** (7392):55–61, 2012.
10. Thrower, F.P. and Joyce, J.E., Effects of 70 years of freshwater residency on survival, growth, early maturation, and smolting in a stock of anadromous rainbow trout from southeast Alaska, *American Fisheries Society Symposium* **44**:485–496, 2004.
11. Catchpoole, D. and Wieland, C., Speedy species surprise, *Creation* **23**(2): 13–15, 2001. Also see articles under ‘Living Creatures Were Equipped to Adapt’, Institute for Creation Research, www.icr.org/life-adapt/.
12. Lightner, J.K., Selection for a behavior, and the phenotypic traits that follow, *J. Creation* **25**(3):96–101, 2011.
13. Peter Borger’s suggestion of ‘VIGE’s’ also outlines organism-centric mechanisms that would explain trait variations more accurately than natural selection in many cases. See: Borger, P., The design of life: part 3—an introduction to variation-inducing genetic elements, *J. Creation* **23**(1): 99–016, 2009.

Phil Gaskill is an analyst and Science Writer at Cramer Fish Sciences in Gresham, Oregon. He holds a Bachelor’s degree in history from Lawrence University in Appleton, Wisconsin (1994) and has a background in the physical sciences and information technology.

Brian Thomas earned a Masters degree in biotechnology in 1999 from Stephen F. Austin State University in Texas. He taught biology and chemistry as an adjunct professor, then later as an assistant professor at Dallas area universities. Since 2008 he has contributed hundreds of online science news and magazine articles as the Science Writer at ICR.
