Cedarville University announces new geology degree

Dear Editor,

I wonder if I could make your readers aware that Cedarville University's Board of Trustees recently approved the formation of the Bachelor of Science in Geology degree, set to begin in fall 2009.

Faculty will equip students for life-long scientific leadership in career fields such as hydrogeology, environmental geology, petroleum geology and numerous other areas of expertise.

Photo taken by Scott L. Huck/Cedarville University

Cedarville University unveils plans for a Bachelor of Science in geology set to begin fall semester 2009.

"The degree will offer a whole host of new opportunities for graduates", shares Dr John Whitmore, associate professor of geology who proposed the major. "Geologists help us find clean drinking water, petroleum, natural gas, coal, and valuable minerals."

The program will be unique in that no other Christian school, which holds to a literal six-day account of Genesis, offers geology as a major course of study to undergraduates. The course of study will be taught from both naturalistic and young-earth paradigms of earth history.

"It is extremely important to develop critical thinking skills within the minds of young scientists", describes Whitmore. "We believe that using a two-model approach of earth history will be advantageous to our students over others who are only taught a one-model, naturalistic approach. Geologists are important when it comes to thinking about earth history, especially within a biblical context."

Course-work will be rigorous and emphasize hands-on experience along with required field work. The geology major will include a wide range of liberal arts classes along with calculus, physics, chemistry, biology, physical geology, historical geology, mineralogy, petrology, structural geology, stratigraphy, sedimentology, geomorphology, invertebrate paleontology, and environmental geology among other upper level areas of study. The major will prepare students for both graduate school and industry. For more information see www.cedarville.edu/scienceandmath.

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The cost of selection

J.C. Sanford's book, *Genetic Entropy & The Mystery of the Genome*, provides one of the most convincing arguments I have ever heard against Darwin's theory, especially as it applies to humans. However, I believe that Sanford made a mistake in his discussion of the cost of selection. His mistake was to use an incorrect definition of "cost". This is not a mistake of any substance, but it creates a potential for confusion if someone were to take his conclusions about his definition of cost and apply them to the standard definition. I hope that he will be happy to be corrected because it only makes the strength of his case clearer.

In Appendix Two, page 179, Sanford says, "the total selective cost (C) to a population is that fraction of the population that is not allowed to reproduce." In fact cost does not mean the fraction of the population that is not allowed to reproduce; it means the rate of reproduction required to make up for them—that is if we are defining it in a way so that the population's maximum reproductive rate gives us the maximum total cost that it can afford.

The mistake is in focusing upon the fraction by which it is reduced, rather than the fraction to which it is reduced. If you reduce one population by three quarters and another by half, then the fraction by which you have reduced the first population is only one and a half times that by which you have reduced

the second, but the fraction to which you have reduced them is different by a factor of two. The reproductive rate applies to those remaining, not to those removed. The required rate is the ratio by which the population size is to be changed—1 to stay the same, 2 to double, 4 to quadruple, etc. Therefore, the cost of removing three quarters of the population is double that of removing half.

Is the rate of reproduction required to make up for removing the whole population only double that required to make up for removing half?

The multiplication model described on page 181 is therefore inapplicable to selection. Only the simpler additive model on page 180 should be applied.

Paul Housley
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Walter ReMine replies:

Paul Housley's letter to the editor is justified in praising John Sanford's book, *Genetic Entropy & The Mystery of the Genome*. Housley is also correct in saying the evolutionary cost concept is more properly viewed in terms of reproduction rate. I agree, since that is the very core of my cost concept.[1–3] The difficulty is how best to communicate these technical issues in the cultural environment that exists today. Let me explain.

The cost of evolution is an important constraint on evolutionary theorizing. In 1957, the evolutionary geneticist, J.B.S. Haldane, proposed the "cost"concept in terms of "elimination of the unfavored individuals",[4] and ever since then the evolutionary literature defines it in those terms. Unfortunately, that traditional cost concept is prone to much confusion and error, and it is embedded in the literature as though in concrete. This obscured Haldane's Dilemma and other evolutionary cost problems from public view. The confusion even allowed evolutionary geneticists to claim these problems were solved, when they were never solved.

My cost concept eliminates the confusion. That is, the fundamental issue is not the *elimination* of unfavored individuals, but rather the *extra reproduction rate* required to increase the favored individuals. The issue is reproduction rate, not elimination. In the simplest tutorial examples, we can mathematically and conceptually translate between the two versions of the cost concept. Compared to the traditional cost concept, my cost concept is easier to understand and more general purpose, and leading evolutionary geneticists, James Crow and Warren Ewens, acknowledge it is correct. Unfortunately, evolutionists refuse to publish these clarifications in their journals. The evolutionists' attempts to forestall these clarifications is a lamentable chapter in the origins debate.

How then should we *communicate* the cost problems to the general public today: using the traditional cost concept (which is already widely embedded in evolutionary journals) or my cost concept (which remains unseen in evolutionary journals)? Previously (as in *The Biotic Message*[1]) I used both approaches in an attempt to maximally communicate. Sanford's book takes a similar approach, and does so handsomely. We had to convincingly communicate tough technical issues to ordinary folks without overwhelming people with needless technical detail. Any science writer would face these decisions. Sanford's book wisely chose to frame the problems so they could be readily authenticated by evolutionary journals. That decision is completely understandable to me, since I took a similar route.

Let me expand on that. In *The Biotic Message*, I attempted to build upon the traditional cost concept, by using it as a stepping-stone to a clearer cost concept. I believed evolutionists would acknowledge the improved clarity, even if it arose from a creationist. However, I later discovered that evolutionists resist these clarifications. Instead, they widely cling to the old, traditional cost concept, (even despite Crow and Ewens' acknowledgement that my cost concept is correct). I discovered it is a mistake to passively tolerate the traditional view, or to build a permanent "bridge of understanding" that would justify the traditional view. Rather the traditional view must be actively opposed as a central source of confusion. So in this sense I agree with Housley's letter—we must press forward with clearer descriptions of the evolutionary cost problems, though this will be awkward in today's environment where evolutionists use their journals to foil attempts at disseminating the clarifications.

My following comments concern the mathematical details of Housley's letter.

Haldane's cost concept assumed tiny selection coefficients (where s is much less than one, approaching zero). That is a very fair assumption, since evolutionists claim the typical beneficial mutation has a selection coefficient somewhere in the range of 0.001 to 0.01. Given his simplifying assumption, the cost is the fraction of the population eliminated. For example, in haploids, Cost = sq, where q is the frequency of the disfavored genotype. That equation happens to be correct, under Haldane's cost concept and mine. Housley's letter gives counter-examples involving extremely high selection coefficients, where half or more of the population is eliminated each generation. That is not typical of evolution, and violates Haldane's simplifying assumption, since the selection coefficients are no longer tiny. The inaccuracy was remedied, if only mathematically, by Crow's equation (in haploids, Cost = $sq/(1-sq)$), which correctly handles all selection coefficients. That equation happens to be correct, under Crow's cost concept and mine. But the conceptual confusion remained in Crow's concept, since it was still based on the fraction eliminated. Also neither

Haldane's nor Crow's cost concept was general-purpose; they were accurate only under special circumstances. That was later clarified by my cost concept, which is clearer and applies to all evolutionary scenarios, in the most general possible manner.

Let me summarize the above point. Housley's counter-examples are technically correct, though they are nearly irrelevant to nature, because they assume the typical substituting mutation has an incredibly high selection coefficient. The difficulty facing Sanford (and all science writers) is how much technical detail to press into a book *aimed at the general public.* I believe Sanford's book handled those tradeoffs well. In this way I here give justice to both Housley and Sanford.

Housley's final point involves many independent mutations substituting into the population simultaneously. Such cases are challenging to analyze. Haldane handled it, quite reasonably, by continuing his assumption that the selection coefficients are tiny (which, by the way, also minimizes the cost of substitution, and thereby minimizes the problem for evolutionists). Next, add the assumption of either the additive-fitness model or the multiplicative-fitness model. (These models describe how the fitness is affected by simultaneous substitutions.) Housley claims the former model is applicable here and the latter model is not. However, using either model, the cost of many independent substitutions occurring simultaneously is approximately equal to the sum of their costs occurring individually—and Haldane's analysis is valid. Haldane happened to frame his 1957 paper[4] in terms of a multiplicative-fitness model, though his analysis would also have been good for an additive-fitness model. Either model applies. In this instance, Housley's claim is not correct.

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Ancient Greeks sometimes used the stars as God intended

Genesis 1:14 speaks of how God created lights in the expanse of the sky to mark seasons, and days and years. Although many have known for centuries that stars can be used for such useful purposes, I was pleased to accidentally come across the following mention illustrating that the usefulness of stars was well described even in the times of Hesiod. Hesiod was a Greek poet who appears to have lived in about the 8th century BC. A very prolific Greek writer called Athenaeus (who lived in about the 2nd century BC) quoted Hesiod as saying: "Begin ye the reaping when the Pleiades (Πληιάδων), daughters of Atlas, rise, and the ploughing when they begin to set."[1] No doubt even earlier mentions of the usefulness of constellations can be found, but this is certainly clear evidence of it in ancient Greek culture.

The quote is also interesting from the point of view of testifying to the very early Greek name of this constellation being fairly fixed. However Athenaeus goes on to say that many of the poets do sometimes call the constellation Peleiai or Peleiades, the latter also meaning Doves.

A few sentences after this quote, Athenaeus states that "it is the appropriate office of those Maidens [Pleiades]… that they should also bring ambrosia [food or drink of the gods] to Zeus." This feminine association supports the statement by Laurie Reece who described how the aboriginal name for the group of stars called Pleiades is based on them being the dream stars of women in the Warlpiri tribe. Reece then states that "The almost universal association of the Pleiades with women is a good indication of the origin of the constellation names prior to the tower of Babel."[2]

The Hebrew Old Testament word translated as Pleiades however may not actually refer to this same constellation.[3]

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The Hittites—second time round

I would like to comment on David Down's recent article, "The Hittites—second time round".[1] As I get time, I follow what David Down presents concerning revising the chronology and also what is reported in websites supporting a traditional timeline. There are some major conflicts, and this report in *Journal of Creation* is a good example. David Down indicates Rameses II should be dated to 759–693 BC.[2] However, a recent article by Charles Aling makes a compelling argument for accepting Rameses II in the 1200s BC according to conventional 19th dynasty dating.[3]