

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<sup>4</sup> 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.

Walter ReMine  
Saint Paul, MN  
UNITED STATES OF AMERICA

## References

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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 8<sup>th</sup> century BC. A very prolific Greek writer called Athenaeus (who lived in about the 2<sup>nd</sup> century BC) quoted Hesiod as saying: “Begin ye the reaping when the Pleiades (Πλειάδων), daughters of Atlas, rise, and the ploughing when they begin to set.”<sup>1</sup> 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 Peleiaades, 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.”<sup>2</sup>

The Hebrew Old Testament word translated as Pleiades however may not actually refer to this same constellation.<sup>3</sup>

Roarie Starbuck  
Brisbane, Queensland  
AUSTRALIA

## References

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3. Starbuck, R., Pleiades and Orion: two ancient Hebrew words, *Journal of Creation* **20**(2):100–103, 2006.

## The Hittites—second time round

I would like to comment on David Down's recent article, “The Hittites—second time round”.<sup>1</sup> 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.<sup>2</sup> However, a recent article by Charles Aling makes a compelling argument for accepting Rameses II in the 1200s BC according to conventional 19<sup>th</sup> dynasty dating.<sup>3</sup>