

RE: The Cost of Substitution

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- *From:* "John Edser" <edser@xxxxxxxxxxxxxxxx>
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"Walter ReMine" science@xxxxxxxx wrote:--

JE:--

Did Edser employ an irrational argument to prohibit the publication ReMine's paper? No, but Felsenstein did. In the paper that was rejected, ReMine correctly criticized Felsenstein's zero cost argument as false because it was demonstrably based on a contradiction. The only ethical thing for Felsenstein to have done was to excuse himself from refereeing ReMine's paper on the grounds of a conflict of interest. Did he do so? No, he did the opposite. He deployed the argument from authority to smear ReMine ...

....

Can a REASONABLE person assume that ... Neo Darwinists are simply closing ranks to protect their own? Most definitely.

John Edser gets it right!
Edser and I are the only ones here who oppose Felsenstein's cost concept.

snip<

HERE IS MY OVERVIEW:

Felsenstein's Review Of ReMine's Paper Submitted For Publication:
"ReMine's treatment ... is also inadequate internally. Take the idea that substitution requires reproductive excess. Suppose that we have a (haploid)

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species with no reproductive excess. Suppose that the environment changes so that all individuals have 20% less reproduction, except for 10% of them who have a particular allele, and those continue to barely replace themselves. A little consideration will show that the replacement will happen, and that the population will end up 90% smaller. But if there is even a slight reproductive excess, then with enough time the population will ultimately recover its numbers. There is then no lower limit on the reproductive excess needed. (Felsenstein's review)"

ReMine's reply:

"Felsenstein chose a scenario that makes the substitution rate exceedingly slow.³ This is obvious when he says:

the population will end up 90% smaller. But . with enough time the population will ultimately recover its numbers. (Felsenstein's review)

By making the substitution rate exceedingly slow, he is making the required reproductive excess exceedingly small – which sets up for what comes next, in the form of a contradiction. The contradiction seems slight, at first, and thus is easily overlooked – until you recognize that it goes to the core issue. I next expose the contradiction:

But if there is even a slight reproductive excess, ... There is then no lower limit on the reproductive excess needed. (Felsenstein's review)

On the contrary, if there is "a slight reproductive excess", then the lower limit on it is, in fact, "a slight reproductive excess" – not zero reproductive excess! His argument fails over that self-contradiction.

It slips passed you unnoticed, because the difference seems so "slight". In his scenario, reproductive excess is required – not zero – contrary to his long-standing claim."

Edser's criticism of Felsenstein's review:

I stated that the contradiction correctly identified by ReMine remains based on Felsenstein's failure to define any Galilean frame of reference. Without defining a population constant Felsenstein's zero cost argument remains relative to nothing defined by anybody. This allowed him to move the goalposts of the problem at will: reduce the point of zero excess by 90%. Using this simple analysis Edser (not ReMine) pinpointed exactly how Felsenstein illegally funded his zero cost argument. However, ReMine chose to only obliquely refer to and subsequently reject, Edser's analysis:

ReMine (oblique reply):

"Joe Felsenstein's error is fundamental. (No, his error is not about 'relative fitness' versus 'absolute fitness', or 'relative' versus 'absolute' frames of reference — though those factors add substantially to the confusion.)" To demonstrate that ReMine incorrectly rejected Edser's analysis I will repeat a model that Felsenstein had posed earlier which appeared to him to remain paradoxical:

Felsenstein's earlier model:

"Suppose there are two alleles, A1 and A2 and the population size remains constant. They are in equal frequencies at the start. In time period 1, as a result of natural selection, A1 increases to 0.52. There is a modest cost

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Remine's cost) for this. Then A1 decreases in the next period to 0, under a Different selection regime. No extra cost. The total cost has been small. But ... suppose we ask about the other allele, A2. In the first time period it decreases to 0.48 (at no cost). Then in the next time period it increases to 1.0, with lots of cost involved. But these are the same events. Looked at one way the cost is small, looked at the other way it is large. Which is true? Perhaps one is supposed to add the cost for increases of both alleles, in which case why are we told that the cost of a decrease of one allele is zero when, if there is only one other allele, there is necessarily a cost for its resulting increase?"

JE:–

The first thing to note is that Felsenstein HAS defined a Galilean frame of reference for this earlier model: the "population size remains constant". Just one point of zero reproductive excess was allowed. This was: the point where the "population size remains constant" which is also the only point of zero reproductive excess.

Let this critical population constant = P. A1 and A2 are defined equal in frequencies to start with. At time 1 A1 increases to 0.52 reducing A2 to 0.48 where $0.52+0.48 = P$. Felsenstein states that "There is a modest cost Remine's cost) for this" (0.02). In fact there is NO cost RELATIVE TO P because the size of the population remains equal to P (zero excess). IOW, the cost of increasing A2 by 0.02 was not over and above maintaining a minimal population constant P defined by Felsenstein for this model. At time 2, A1 decreases to zero allowing A2 to increase to 1 so that A2 substitutes for A1 at what appears to be a larger cost. However, this also was completed at just a zero cost relative to P because the population remained equal to P. The completed substitution did not require the population to increase or decrease, simply remain stable. IOW as long as the population MINIMALLY maintained itself equal to P there was no extra costs involved.

Felsenstein addressed the events for the A2 allele which to him appeared paradoxical: "In the first time period it decreases to 0.48 (at no cost). Then in the next time period it increases to 1.0, with lots of cost involved. But these are the same events. Looked at one way the cost is small, looked at the other way it is large. Which is true?".

My answer: neither. Paradoxes simply do not exist. Every paradox indicates a CRITICAL error of reasoning. The increase of allele A2 to 1 required zero reproductive excess and therefore no cost RELATIVE TO P. Only if the population had been reduced to something below P would a reproductive cost of substitution be required, i.e. a cost over and above minimally maintaining that population from evolving to extinction (zero excess). Felsenstein's paradox was created by his error of measuring costs relative to each allele (which were defined variables) and not relative to P which alone was his defined population constant. The comparative cost of allele A1 increasing to 0.52 was small but the cost of allele A2 increasing to 1 removing allele A1 was large (all relative to just alleles). However, both costs relative to P remained zero removing Felsenstein's cost paradox. It is never valid to employ just a variable as a valid frame of reference.

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As Galileo argued so long ago, a defined constant is always required. In the model that Felsenstein posted this was P (his defined population constant). However, in Felsenstein's review of ReMine's paper (which resulted in that paper being incorrectly rejected for publication) no population constant was defined. By reducing the population by 90% P became reduced from representing a critical constant to just another variable reducing the cost to zero within a population only 10% of the original.

Felsenstein simply repeated the error which produced the cost paradox in the model: he incorrectly calculated the cost relative to just another variable which was here, the smaller population compared to the original as just population variables. IOW he allowed P to become reduced to just a variable allowing no frame of reference. A constant is exactly what the term implies: something which never changes "ad hoc". When it is, any constant becomes reduced to just a variable. Arguments based on just variables remain irrationally arbitrary (as Felsenstein's posted argument and model demonstrated).

Felsenstein should apologize to ReMine and request him to resubmit his paper for a VALID review. ReMine should either acknowledge Edser's analysis or provide reasoning for rejecting it.

Evasion is simply not a rational option for anybody.

Regards,

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