

## Re: limit of selection???

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**From:** A.C.H. (*br.hessels\_at\_planet.nl*)

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"Malcolm" <malcolm@55bank.freemove.co.uk> wrote in message  
news:<cg7u10\$236v\$1@darwin.ediacara.org>...

> "A.C.H." <br.hessels@planet.nl> wrote

>>

>> *The following reason is, i believe, not in those lists:*

>>

>> *because an adaptation is caused by its selection pressure, it can not*

>> *escape its selection pressure.*

>>

>> *Again:*

>> *The adaptation is linked to whatever selects it, it can not outperform*

>> *it.*

>>

>> *Again:*

>> *an example: a prey will never be able to definitely outperform its*

>> *predator, because there is no selection beyond what's actually doing*

>> *the selecting (the predator).*

>>

> *There is no point in having something that is more effective than needed.*

> *For instance, most animals that are adapted to temperate climates are*

> *unlikely to go for more than a day or so without finding water. If they were*

> *transplanted to a desert then they would starve because of lack of food*

> *anyway, so elaborate systems for conserving water have not evolved.*

> *There is also very frequently a cost associated with an improvement. For*

> *instance spiders could spin bigger webs and catch more flies, but they would*

> *need to produce more silk to do it. The actual web size is probably a very*

> *good compromise.*

> *Then evolution is a dynamic process. For instance childbirth is very*

> *hazardous for human females, because head size has expanded faster than hip*

> *size. In several millions of years this will be solved, by selection for*

> *women with wider hips or for more premature births. However the adaptive*

> *process has not yet caught up.*

The issue i was trying to pose was what this would mean, how far  
selection can push an adaptation, how perfect it'll become.

[moderator's note: I can't be the only one thinking of Fisher's

Fundamental Theorem here, can I? The rate of evolution is proportional to the product of the selection gradient, the genetic component of phenotypic variation, and the heritability of the trait. Does no one else think this is relevant here? – JAH]

Compare these two situations:

1) Childbirth is a problem, females die during birth. Evolution by natural selection is happening, which is the cause of adaptation (easier childbirth).

2) Women are perfectly adapted to giving birth, childbirth is no problem at all, no women die giving birth. In this case, the natural selection, which caused the adaptation in the first place, falls away.

Therefore the state of perfect adaptation (all women give birth easy) cannot be reached, because, paradoxically, the cause of the adaptation: natural selection, falls away when you approach this state.

So i predict: child birth will be less hazardous, but will never be easy.