

Re: The Baldwin Effect: What is it trying to say?

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- *From:* William Morse <wdmorse@xxxxxxxxxxxxx>
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John Wilkins <john@xxxxxxxxxxxxx> wrote in
[news:dncjg0\\$10bq\\$1@xxxxxxxxxxxxxxxxxxxxx](mailto:news:dncjg0$10bq$1@xxxxxxxxxxxxxxxxxxxxx):

> William Morse wrote:

>> While somewhat older than 10,000 years, there is a very good recent
>> example of what I would consider a Baldwin effect change in the human
>> genome – namely the rapid acquisition of the ability to digest
>> lactose in adult humans in several different populations of humans in
>> northern Europe and in Africa. This came about because of the
>> adoption of herding dairy animals by these populations, which
>> suddenly made the ability to digest lactose as an adult a significant
>> asset in surviving.

> The thing about the BE is that we might not recognise one when we saw
> it. Consider the following fictional story: About 5000 years ago
> people began to farm cattle for milk, but bovine milk is often
> indigestible to humans due to a long-chain molecule lactose.
> Nevertheless it is a rich renewal resource of protein and energy. So
> some societies manage to figure out how to make it digestible with the
> use of bacteria and heat. This makes dairy products a fitness peak.

> A mutation arises which makes people less intolerant of bovine
> long-chain lactose. This mutation "encounters" a fitness landscape in
> which the ability to digest *all* kinds of milk-products is very fit
> indeed. So that mutation spreads, supplanting to a degree the learned
> cultural behaviours.

> Is that not a BE? But would we recognise it as such or just say that
> the lactose-tolerance mutation is fitter, not noticing that it is
> fitter because of prior cultural knowledge?
>

In that respect the BE is the reverse of speciation. A speciation event will generally not be recognized as such while it is occurring – it is only in retrospect that it can be seen to have occurred. Two populations might be separated for a time and start to differentiate, but later be brought back in contact while still able to interbreed. So we may be able to say "this _was_ a speciation event" but we may not be able to say

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"this _is_ a speciation event".

With the Baldwin effect, while we can guess when it is involved it may be impossible to prove retrospectively that it was involved. Unless one can observe a learned behavior becoming genetic, one does not know that the genetic change is not the result of selection in the absence of prior learning. Perhaps the proto-beavers never "learned" to improve the dams – the ones that happened to innately build dams were selected for. Perhaps other factors such as neutral drift or founder effect were the cause of the change. Now if we observe it taking place, we can see that yes this behavior is being learned and then by golly it is being codified in the genes. So we may be able to say "this _is_ a Baldwin effect event" but we may not be able to say "this _was_ a Baldwin effect event".

Yours,

Bill Morse

• **References:**

- ◆ ***The Baldwin Effect: What is it trying to say?***
◇ From: whitesickle@xxxxxxx
- ◆ ***Re: The Baldwin Effect: What is it trying to say?***
◇ From: Guy Hoelzer
- ◆ ***Re: The Baldwin Effect: What is it trying to say?***
◇ From: William Morse
- ◆ ***Re: The Baldwin Effect: What is it trying to say?***
◇ From: John Wilkins

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