

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

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- *From:* "g" <gillawton@xxxxxxxxxxxxxx>
 - *Date:* Wed, 14 Dec 2005 02:48:41 -0500 (EST)
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"Guy Hoelzer" <hoelzer@xxxxxxx> wrote in message
[news:dn32pv\\$2c98\\$1@xxxxxxxxxxxxxxxxxxxxxxxxxxxx](mailto:news:dn32pv$2c98$1@xxxxxxxxxxxxxxxxxxxxxxxxxxxx)

>I hope this thread gets plenty of attention. I am very interested in the
> Baldwin effect myself and would like to understand it better.

>

> in article [dmve35\\$kve\\$1@xxxxxxxxxxxxxxxxxxxxxxxx](mailto:dmve35kve1@xxxxxxxxxxxxxxxxxxxxxxxx), whitesickle@xxxxxxx at
> whitesickle@xxxxxxx wrote on 12/4/05 10:55 AM:

>

>> Apparently the Baldwin Effect has some efficacy in computational models
>> but I do not understand mathematics and I think computational modeling
>> by itself is insufficient to make the evolutionary point. First, I read
>> Baldwin's theory was intended to replace Lamarck's theory of acquired
>> characteristics.

>

> It might have that effect, but I don't think that was the goal.

Guy, I don't think you intend to imply that effects have goals. They are
predictable net results, only.

Not meaning to nit pick, but believing this is closer to your meaning.

>

>> Second, I read Baldwin's Effect was associated with
>> genetic assimilation and canalization but some researchers now are
>> saying it doesn't depend on genetic assimilation.

>

> I think the point of genetic assimilation and canalization under the
> Baldwin
> effect was that these are means of codifying (making more permanent)
> adaptive responses to environmental challenges that are plastic in
> individuals.

Yes, and, again, am believing you concur that this codification (or making
more permanent) is not a proactive certification or decision, but a kind of
increase in establishment resulting from reinforcement both positive and
negative — e.g., affirmative result from presentment of the particular
feature, behavior, quality... in question, contemporaneous with negative
result from departure from resentment are a double reinforcement phenomenon.
Do you concur?

>Perhaps the researchers suggesting that the Baldwin effect does not depend

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>on these mechanisms have discovered or imagined other codifying mechanisms.

Any one, or any combination of, mechanism(s) which would "experience" positive, or negative, or non-consequence would suffice. For example, nerves 'experiencing' (or 'sensing') stress provided by heat --- by an organism lying on a rock in the sun --- might cause it to twitch, and thus perhaps roll off the rock and fall into water, or into a shadow, and survive, rather than become traumatized by more heat than it can handle. Now if that organism had a particularly more sensitive area (a precursor of an eye, perhaps) that would provide positive selective reinforcement. If its entire encasement organ (skin) were to be able to sense the heat stress generally, that would be a dual reinforcement. And if it had limbs with digits (fingers or toes) with particularly heat sensitive, or pain sensitive neuronal tips, then that would amount to multiple reinforcement 'experience' mechanisms. The more the better.

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>> Very strangely, the general point of Baldwin seems to be the phenotype(s)

>> plasticity and

>> effecting "changes" in it with no direct connection between phenotype

>> and genotype. I'm inclined, unless it can be shown otherwise, the

>> Baldwin Effect has had minimal effects on evolution.

>

> IMHO there is no DIRECT connection between genotype and phenotype.

> Development of phenotype is affected by an interaction between the genome

> and the environment. Personally, I see the Baldwin Effect as potentially

> very important in evolution. It might even be one of the most fundamental

> aspects of evolutionary adaptation in the sense that mutations may rarely

> be

> beneficial independent of the plastic behaviors expressed in the

> population.

> I think this remains an open question.

Not following you precisely, but it does indeed seem reasonable to expect that selection features are a hit or miss proposition, only, and would not follow any progression toward evolving any given complex selection feature that yields significant survival advantage unless combined with feedback (useful experiencing) mechanisms and response. (Response in early precursor stages might very well be inadvertent and direct (i.e., by direct, non-interpretive stimulus response path, where the response just happens to be --- or produce --- an advantageous response to the cause of the stimulus). Such a response would tend to become more 'established' by reinforcements positive, negative, inappropriate... as each provides, prevents, or bears no benefit in kinds of response. And, over much redundancy of similar or identical results feedback (having nothing to do with interpretation) would the successive progeny of an organism accumulate add-on opportunities to mutate in ways that might further refine into interpretation, alternative response patterns, etc. Still more time, and consistency of feedback would be required (perhaps a billion years) for the development of a hierarchy of increasingly complex devices for sensing, and devices for further refining response (including qualitative and quantitative interpretation, conscious decision making as to response... leading from knee-jerk, to awareness, to

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interpretative thought, to reasoning, to imagination and application of reasoning to problem solving even in anticipation of a risk, and problem-solving strategization even prior to encountering a particular risk-related stimulus as many humans are capable of doing.

>

>> Learning is the most cited example of Baldwin's Effect. Yet ever since recorded civilization humans have remained basically unchanged by Darwinian evolution.

>

> Wow. I find this to be wildly at odds with my personal viewpoint. What reasoning or evidence do you have to support this claim.

Let me echo that question. A few months ago, there was much discussion about the variable definitions of "learning." Some contributors spoke of learning as though a knee-jerk response, that serves to enhance survival, is "learned." Others prefer to think of "learning" only in the sense of conscious memory. Some like to speak of adaptive changes in DNA and/or RNA as being a process of "learning."

Each of these (and other) definitions *can* be utilized rationally, but unless we make clear which definition we intend, in making a statement such as the above, it may mislead others. I prefer to use the term "learning" to mean only the kind of information and information processing that can be done in absence of direct stimulus, as well as in response to direct stimulus (vis a vis a process of acquiring survival advantage by acquiring knowledge by observation or by communication from others, as well as by "getting burned," as the expression goes. It would be helpful if Whitesicle would remove ambiguity on his precise intended meaning here. So much for the "learning" issue.

>>Now to the statement "Yet ever since recorded civilization humans have remained basically unchanged by Darwinian evolution."

Does this statement say anything at all, actually? Darwin made an ingenious stab at trying to pull together what evolution is. He did not create evolution, or a kind of evolution. Evolution, by ANY definition is descriptive, not prescriptive. And despite the fact that Darwin increased the understanding of the issues, and did offer many explanations that have borne up under scientific scrutiny (as well as some that have NOT borne up 100% under that scrutiny, especially in the face of the further accumulation of data Darwin did not have the time nor the instrumentation to observe and measure that would continue to come out of advances in technology). But MOST IMPORTANT OF ALL, what evolution is about IS change. To say that it has not changed anything... makes no more sense than to say that transportation does not transport anything or children's play does not play anything.

To say that humans have not changed since the beginning of civilization is — as you have indicated, Guy

— about as accurate as saying that humans are the same size as when civilization began, have the same life span as when civilization began, are distributed in the same numbers as when civilization began, are

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demographically distributed in the same way as when civilization began, die in the same proportions from the same causes as when civilization began, gather or raise the same foods as when civilization began, are the same average weight as when civilization began, rely upon the same modes of transportation as when civilization began, have the same genetic defects as when civilization began... no more and no less...

Changes in man ARE evolution of man, just as all long term bio-changes are evolution of flora and fauna generally. These changes have always been gradual. (Even during periods of so-called rapid change, as proffered by the concept of punctuated equilibrium, the time frames of substantial changes, as measurable from archeological and artifactual samplings, have taken many thousands, or hundreds of thousands, or many millions of years. If we watch casually an hour hand on a clock for one minute, we may not be able to discern that it has moved an iota. Science today, however, can measure increments of change to so fine a point that the time it takes a light beam to travel from one end of a laboratory to the other can be measured to an accuracy of many places after a decimal per second.

Casual observation of evolutionary change in mankind is not equivalent to watching an hour hand for a minute; it is more comparable to watching a millenium hand, for a batting of an eye. But science DOES have technology, and quite a few tons of archeological evidence, and much equipment for measuring tiny increments of change (change synonymous with evolution; evolution synonymous with change) in man's morphology, temperament... despite how small the increments of that change... and the technology and 'scientifically responsible' data accumulation continues to accelerate our capability of perceiving and measuring and analyzing that change — despite how slow it occurs.

But, even with that said, the question remains as to why we would want to say, instead of evolution of man does occur and is occurring, that "Darwinian evolution" has not changed man... sort of spins both Darwin and the change (evolution) he brought better understanding of (far less than complete or perfect understanding, but merely a giant step forward) in a way that suggests a view of them that is not in accordance with what is a meaningful significance of either.

Purpose here is NOT to put whitesickle down. It is merely to offer a viewpoint with which he, himself may concur. After all, biological evolution is not easy to put into thoughts or words, because it has been going on so very, very slowly, and for so very, very long, and involves so very, very many diverse directions in its progression along so many different species lines... The best ANY of us can do is bounce our minds against a wall of cumulative human ignorance, built out of many bricks of uncertainty and apparent contradiction. (Yet evidence it has occurred and is even now continuing to occur is overwhelmingly super-abundant... and even that is an understatement (:>).

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>> Our "learning" or education has increased as has

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>> our knowledge but genetically we haven't much.

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> I suppose the word "much" is subjective, so there is room for differing
> opinion on this claim. In my estimation, the human gene pool has changed
> enormously over the past few thousand years, given the constraints on gene
> pool evolution that accompany rapid population growth. I think that gene
> pools tend to change much more dramatically during times of population
> contraction, given the same selection pressures.

Guy, you do have an advantage over such laymen as whitesickle and me -- by virtue of the fact you are working at the very frontiers of research where answers are forthcoming about what is going on at the utmost reachable (so far) chemical, cellular, genetic, proteomic level.

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>> Therefore, there hasn't
>> been any evidence of Baldwin's Effect on Darwinian evolution as I see.
>> If one defines evolution to also entail cultural evolution then I would
>> argue Baldwin's Effect has had some effect on evolution...but not a
>> whole lot.

>

> Well, yes I would certainly include cultural evolution in this subject,
> because individually plastic behaviors can become codified as cultural
> practices.

The problem most lay people (and undergrads) have in trying to get a grasp of mechanisms leading up to codification of cultural experience (including participatory experience) is that they... we... tend in the beginning to look at a picture of things as they are now, and fail to take into account how many, many, many tiny baby step increments of change it took for the current picture to come about. It is only when we begin to attempt to see the current picture as little more than a handful of frames in a movie, as it were, that is comprised of billions upon billions of such frames and baby steps... and realize that today is no more the final frame than was one birth of one dinosaur... that we begin to think of evolution (change) as it really is. (And here I refer not merely to bio-change... bio-evolution... but to evolution of the earth and all its sub-systems, the solar system we are in, the universe we are in...

Patterns in the story (evolution... change) are not perceivable in a single frame, any more than the motion of a bullet is discernible when photographed by a sufficiently high-speed camera that freezes a micro-moment that looks like it is motionless. Neither are some patterns discernible until and unless we have sufficient samplings from many thousands or millions of frames... (and thank heaven samples are still being gathered, experiments still being conducted, and technology for discerning elusive long-term patterns still coming in in abundance).

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>> The only way I see Baldwin's Effect having a significant
>> effect is if the continuation of learning and knowledge goes beyond the
>> idea of effecting changes in phenotypic plasticity without a direct
>> connection between phenotype and genotype.

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- > Here is a classic, though somewhat hypothetical, illustration. Pinnipeds
- > (seals and sea lions) evolved from canid ancestors. Imagine that the
- > environment of the ancestral canid population changed such that this
- > dog-like species was forced to forage for intertidal marine species,
- > rather
- > than say hunting for other large mammals (maybe in packs). This would be
- > an example of behavioral plasticity. Now that these canids are depending
- > on their ability to hunt for marine prey, any mutation that makes them
- > better at doing so would be favored by selection. Had the canids not
- > manifested intertidal foraging behavior, this mutation would be of no
- > value.
- > Hence, this population of canids might have evolved into an early form of
- > pinniped through the genetic codification of a behaviorally plastic
- > change.
- > Does this seem unlikely to you? I could see how it might seem like an
- > unusual circumstance, but I would argue that we haven't explored this line
- > of thinking well enough to reject it as a general phenomenon.
- >
- > Guy

Guy, as you and I have discussed before, there is a tendency among those not acquainted with the fine points of things you are privy to, to view the current stage (one only being passed through, like all others before it, and like all yet to come) and attempt to draw conclusions from it. You help us to look deeper.

Thanks for sharing from your deeper well of experience...

g

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• **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
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