Why Ken Wilber is wrong about

EVOLUTION

And ignores the evidence for it.

Two academic papers, 2010 and 2020

Frank Visser

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****** Honorable Mention Paper in the Category Constructive Criticism ******

THE 'SPIRIT OF EVOLUTION' RECONSIDERED

Relating Ken Wilber's view of spiritual evolution to the current evolution debates

FRANK VISSER

Abstract How should Ken Wilber's stance on evolutionary theory and neo-Darwinism be evaluated? Evolution is a central concept in Wilber's oeuvre as evidenced by expressions such as: "The Spirit of Evolution", "Evolution as Spirit-in-Action" and "Evolutionary Spirituality". For Wilber, evolution is a spiritual phenomenon, both guided by as well as heading towards Spirit. Yet, in mainstream evolutionary theory, the term "evolution" has quite different connotations. Does integral theory have a substantial contribution to make to the subject of evolutionary theory or is it merely producing metaphors that provide meaning and significance for those in search of an uplifting philosophy of life?

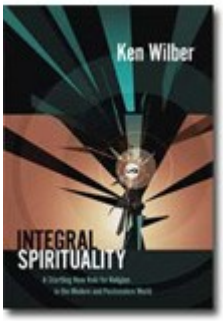
Note: For ease of reading, quotes from Wilber are marked by a dotted line on the left and set in bold type, just like this sentence.

INTRODUCTION

I consider Ken Wilber's view of evolutionary theory to be deeply flawed and disconnected from the scientific literature.

Last year was both the 150th anniversary of the publication of Charles Darwin's *The Origin of Species* (which was published in 1859) and the 200th year anniversary of Darwin's birth (1809). All over the world, the importance of Darwin for the development of science has been commemorated. Daniel Dennett (1995: 21) once called Darwin's notion of evolution through natural selection "the single best idea anyone has ever had". The integral community has virtually ignored this event. One can agree or disagree with Dennett's assessment, but one can't ignore the topic.

Not surprisingly, evolution in the Darwinian or neo-Darwinian sense has been largely ignored by Ken Wilber as well. Contrary to what the casual reader of his works may expect—given the prominence of the term "evolution" or "evolutionary" in the integral vocabulary—a detailed engagement with Darwinism is virtually absent from his writings—except for some notable exceptions we will have a chance to focus on later in this talk.



In contrast, Wilber has tried to make a case for "spiritual evolution", or the general idea that evolution at large is driven by some transcendental Force—variously called "Spirit" or "Eros". "There's an Eros to the Kosmos" is one of his favorite phrases. This one occurs in his recent book *Integral Spirituality*:

That drive—Eros by any other name—seems a perfectly realistic conclusion, given the facts of evolution as we understand them. Let's just say there is plenty of room for a Kosmos of Eros (Wilber, 2006a: 236n.)[1]

This idea of a spiritual Force behind evolution echoes views from spiritualists, esotericists, occultists and creationists.[2] The idea of a "Spirit of Evolution" is Wilber's key concept—more central than holons, heaps, or artifacts; quadrants, levels, lines, states and all that jazz... Long before the quadrants, even before the

stages, there was the involution/evolution scheme—it is the most consistent element in all of Wilber's works.[3]

So let us ask, then, the all important question: how strong is his case? Does he have one, scientifically speaking? How does he argue for it? What is the substance and form of his argument?

*

Of course, spiritually, Ken Wilber is free to postulate anything he likes, but because he repeatedly refers to certain scientific data in support of his specific view of evolution, we will have to take a closer and critical look at these data. And if Wilber's purpose is to complement or transcend the current neo-Darwinian theory of evolution with some kind of spiritual theory, it is paramount that the scientific theory of evolution is presented in the strongest possible way. Otherwise, the integral attempt at model-making will end up as a case, not of "transcend-and-include" but "transcend-and-distort"... Not to mention the M-word of "misrepresentation".

However, science is by its very nature bound by a methodological constraint: it cannot just invoke Spirit to explain the (as of yet) unexplained. That's not because science wants to be blind, but because this is the only way to avoid endless circularities: plants grow because God makes them grow, we can think because we have the power of thought, wings evolved because Spirit created them... In science, that is considered to be a non-starter... [4]

Some other considerations have to be taken into account as well, before we turn to Wilber's treatment of evolution.

In spiritualist accounts, the scientific theory of evolution is often presented in a rather gloomy, not to say *appalling* fashion: according to the scientific worldview, we live in a meaningless and purposeless universe and are the products of random chance. Then, at the very moment you are about to kill yourself, the spiritualists present a much more *appealing* view of evolution: we are part of a universal process which is not only heading for Spirit, but driven by It as well. It's all "onwards and upwards" in this view of life. Who in his right mind would not

vote for the second option? We might well heed Richard Dawkins' admonition here, that in science, what counts is not that an idea is *comforting*, but that it is *true*... In the final analysis these emotional judgements don't count. (And for some, of course, science is appealing and spirituality appalling...)

The spiritualist is aided in his appeal because the laymen's understanding of evolution is "creationist": how can things as complex as organisms and organs possibly be the result of evolution by mere chance? Living things, at face value, look designed. Obviously, these things must have been created in some way? Curiously, science has come to a different and opposite understanding: yes, these things have come about without any creative hand. Implausible as it may seem at face value, they can be explained in a more naturalistic way. This switch or conversion to a scientific perspective is something everyone has to make for himself by a certain effort. Now, Wilber wants to complement the science approach by some kind of spiritualist perspective. In this, he caters to the laymen's understanding of most of his readers—who are not aware of the details of evolutionary theory—not to the experts in the field of biology. This is one important reason for his popular appeal.

I think it is for these reasons that Wilber's take on evolution has had no impact in academia so far. Evolutionary science did not change its course after Wilber published his "20 Tenets" on evolution, in *Sex, Ecology, Spirituality* in 1995, or when he tried to dismiss neo-Darwinism briefly in its popular sequel *A Brief History of Everything* published a year later (1996). However, his occasional statements on evolutionary theory have met with strong criticism on the Internet and it is to these that we will have to turn to assess Wilber's notions about evolution.

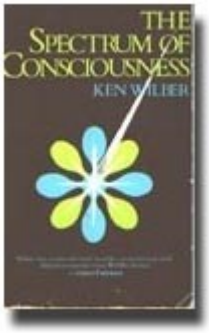
While I am not an evolutionary biologist, my extensive reading in this field demonstrated to me that the world and worldview of science is quite different from what one learns from spiritualist accounts of it. **I consider Ken Wilber's view of evolutionary theory to be deeply flawed and disconnected from the scientific literature.**

But first we will have to get a feel of what exactly Wilber means by the concept of evolution. For this, we will briefly review his published writings, both in print and online. We may well take

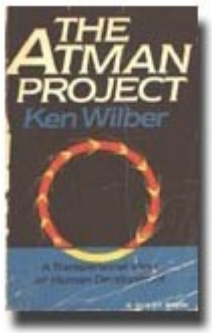
this opportunity to see if his ideas on evolution have been consistent over the past three decades.

WILBER ON EVOLUTION - IN GENERAL

Somehow one gets the feeling that Wilber systematically overlooks the relevant literature...



In his first book, ***The Spectrum of Consciousness*** (1977), the term "evolution" features prominently as the heading of Part One of two parts, Part Two being called "Involution". This sets the tone for a thoroughly spiritualist exposition of the subject. As he explained later, in the 20th anniversary edition of the book (Wilber, 1993: xix), at that time he was following A.K. Coomaraswamy's usage of these terms. Briefly, "Evolution", in this sense, means a movement from the One or God to the Many or the manifested world. (Other traditions would call this "emanation"). "Involution", then, is the opposite movement: from the Many to the One. In the first phase, Spirit loses itself in the world, in the second, Spirit returns to itself again as Spirit. In such a book, one would sooner find a reference to Dante than to Darwin...



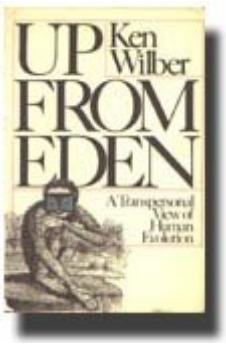
In ***The Atman Project*** (1980), the meaning of these two terms is reversed. This time, Wilber follows Sri Aurobindo's understanding (Wilber, 1993: xix). This time, involution is the "downward" movement from Spirit to the world of the Many; and evolution the "upward" movement from the world to Spirit. This would remain the dominant model in Wilber's mind for years to come: evolution is seen as a movement that is both driven by Spirit and directed towards Spirit.

In ***Up from Eden*** (1981), which was sub-titled "A transpersonal view of human evolution", the same scheme is used by Wilber to organize the field of human evolution, i.e. anthropology. Wilber

starts his narrative with the first hominids, but does not cover evolution per se.

Further in the book, Wilber (1981: 304-305) summarizes his view on evolution (following Jan Smuts) thus:

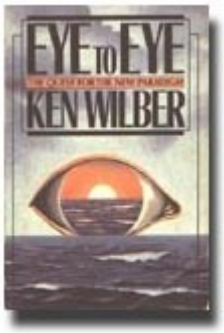
Everywhere we look in evolution... we find a succession of higher-order wholes: each whole becomes part of a higher-level whole, and so on through the evolutionary process. I am not going to argue the point, but take it as plainly obvious that "natural selection" per se cannot account for that process. Natural selection can account, at best, for the survival of present wholes, not for their transcendence into higher-level wholes. To the average biologist, this sounds shocking, but the conclusion, of those whose specific field is the theory of scientific knowledge is straightforward: "Darwin's theory... is on the verge of collapse...."



Incidentally, this quote is taken from *Forgotten Truth* (1992/1976: 134n.) by Huston Smith, author of the famous *The World's Religions*—a scientist of religion, but not a biologist. Smith himself actually quoted this from a *Harper's Magazine* essay "Darwin's Mistake" by Tom Bethell (1976), which prompted a defense from none other than Stephen Jay Gould called "Darwin's Untimely Burial" (*Natural History*, 1976), in which he concludes: "I rather suspect that we'll have Charles Darwin to kick around for some time." Rather typically—I must say—we are not informed of this by either Smith or Wilber, who relies solely on spiritualist sources. And spiritualism has a vested interest to see Darwinism fail.

Wilber concludes:

The point, in a phrase, is that the orthodox scientific theory of evolution seems correct on the what of evolution, but it is profoundly reductionistic and/or contradictory on the how (and why) of evolution. But if we look upon evolution as the reversal of involution the whole process becomes intelligible. (Wilber 1981: 305) [5]



Speeding up our chronological survey of Wilber's books a bit, we come to ***Eye to Eye*** (1983), in which Darwin is briefly mentioned as representative of Worldview-I "Evolution as movement from

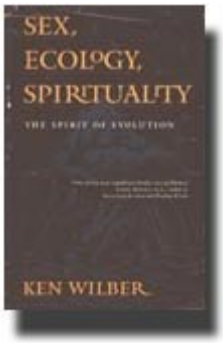
lower to higher", and in which Wilber comments:

[T]he strict theory of natural selection suffers from not acknowledging the role played by Spirit in evolution. (Wilber 1983: 205).

Skipping a few books in which evolution isn't mentioned, we come to Wilber's magnum opus ***Sex, Ecology, Spirituality*** (1995), which has aptly been sub-titled "The Spirit of Evolution". In this vast work, Wilber proclaims his "Twenty Tenets" covering all processes of evolution: cosmic, biological and social. But again, neo-Darwinian theory is not engaged. In close to 900 pages, Darwin is mentioned only once in a more-than-passing way:

Although the notion of evolution, or irreversible development through time, had an old and honorable history... it was of course Wallace and Darwin who set it in a scientific framework backed by meticulous empirical observations, and it was Darwin especially who lit the world's imagination with his idea on the evolutionary nature of the various species, including humans.

Apart from the specifics of natural selection (which most theorists now agree can account for microchanges in evolution but not macrochanges), there are two things that jumped out in the Darwinian worldview, one of which was not novel at all, and one of which was very novel. The first was the continuity of life; the second, speciation by natural selection. (Wilber 1995: 10).



Note that—again typically—Wilber claims a scientific consensus for the opinion he expresses—"most theorists now agree"—without specifying which sources he has used to backup this opinion, nor, for that matter, what exactly he means with the terms "micro" and "macro": individual vs. social development, human vs. cosmic evolution, or even the evolution of new species, or races, or organs? This pervasive vagueness on what exactly evolutionary theory supposedly can and cannot explain weakens his statements on evolution. They echo sentiments found in the creationist literature.

Turning to the Twenty Tenets (Wilber 1995: 35-78), the one that stands out in this context is Tenet 12: "Evolution has directionality". Though it takes Wilber twelve pages to argue this point, for which he claims support from numerous authors—mostly philosophers or social scientists, such as Whitehead,

Derrida, Foucault, Freud, Marx, and chaos theorists—notably absent are those who should be consulted first: evolutionary theorists. Wilber fails to mention that the notion of directionality in evolution has been and is highly problematic. It was, again, Gould (1989) who vehemently opposed this concept and brilliantly argued for its non-validity (Wilkins, 1997).

To give only one example from Michael Ruse, author of *Monad to Man: The Concept of Progress in Evolutionary Biology* (1996: 535, quoted in Meyerhoff, 2006a, in a critical review of the Twenty Tenets in his book *Bald Ambition*), which is the first volume of a trilogy (Ruse 1996, 1999, 2003) on precisely this vexed question of progress or purpose in evolution:

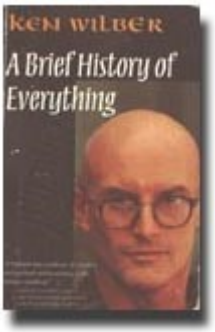
More recent work, for instance on measures of complexity, simply shows . . . that there is just no good reason to think that complexity is a necessarily ever-increasing product of the evolutionary process.

Somehow one gets the feeling that Wilber systematically overlooks the relevant literature... Confronting Wilber's notions about evolution with both Integral World authors (Edwards, Smith, Goddard) and experts in the field (Ruse, Dawkins, Gould, Goodwin) Meyerhoff's (2006) conclusion about the 20 Tenets is sobering:

[T]here are many anomalies and contradictions which show that the 20 tenets do not describe the "'laws' or 'patterns' or 'tendencies' or 'habits'" that "all known holons seem to have in common," as Wilber contends.

WILBER ON EVOLUTION - IN DETAIL

Sex, Ecology, Spirituality was followed by the more accessible ***A Brief History of Everything*** (1996), and this time, Wilber descends to the level of specific examples when arguing his points about evolution. He again resorts to statistical considerations:



Calculations done by scientists from Fred Hoyle to F.B. Salisbury consistently show that twelve billion years isn't enough to produce even a *single enzyme* by chance.

In other words, something other than chance is pushing the universe. For traditional scientists, chance was their god. Chance would explain it all. Chance—plus unending time—would produce the universe. But they don't have unending time, and so their god fails them miserably. That god is dead. Chance is not what explains the universe; in fact, chance is what that universe is laboring mightily to overcome. Chance is exactly what the self-transcending drive of the Kosmos overcomes. (Wilber 1996: 26)

It is obvious, then, that Wilber leaves essential information out of his presentation when making his points about evolution.

Though we will touch on this chance-argument later, let's just note that Dawkins' *The Blind Watchmaker* (1986), written a full decade before *Brief History*, is a brilliant treatise on evolution NOT being the product of mere chance but of random chance and non-random natural selection (a distinction lost on Wilber). From its Preface, and as if addressing Wilber in person (1986: xv):

The great majority of people that attack Darwinism leap with almost unseemly eagerness to the mistaken idea that there is nothing other than random chance in it. Since living complexity embodies the very antithesis of chance, if you think that Darwinism is tantamount to chance, you'll obviously find it easy to refute Darwinism! One of my tasks will be to destroy this eagerly believed myth that Darwinism is a theory of 'chance'.

Sahotra Sarkar (2007: 44), "integrative" biologist and philosopher of science, points to the same insight in his book *Doubting Darwin?*: "Chance may be aided by a potentially infinite number of natural processes." Unfortunately, *The Blind Watchmaker* is not referenced in *Sex, Ecology, Spirituality*, and *Brief History* doesn't have any references at all.

In a later book, *Climbing Mount Improbable* (1997), Dawkins is even more emphatic and explicit (where he refers to the popular chance-argument against evolution):

It is grindingly, creakingly, crashingly obvious that, if Darwinism were really a theory of chance, it couldn't work. You don't need to be a mathematician or physicist to calculate that an eye or an hemoglobin molecule would take from here to eternity to self-assemble by sheer higgledy-piggledy luck. Far from being a difficulty peculiar to Darwinism, the astronomic improbability of eyes and knees, enzymes and elbow joints and the other living wonders is precisely the problem that any theory of life must solve, and that Darwinism uniquely does solve. It solves it by breaking the improbability up into small, manageable parts, smearing out the luck needed... (Dawkins 1997: 67-68)

It is equally obvious, then, that Wilber leaves essential information out of his presentation when making his points about evolution and its mechanism. He apparently disagrees with Dawkins on this matter, but without confronting Dawkins' arguments, Wilber's thesis becomes empty. Rhetorical maneuvers like repeating the word "chance" about seven times in one paragraph—as a kind of mantra—cannot compensate for this deficiency.

Dawkins summarizes the options in a more recent work, *The God Delusion* (2006:121) as follows:

Creationist [and integral?] 'logic' is always the same. Some natural phenomenon is too statistically improbable, too complex, too beautiful, too awe-inspiring to have come into existence by chance. Design [Eros] is the only alternative to chance that the authors can imagine. Therefore, a designer must have done it. And science's answer to that faulty logic is also always the same. *Design is not the only alternative to chance. Natural selection is a better alternative.* Indeed, design is not a real alternative at all because it raises an even bigger problem than it solves: who designed the designer? [What's the probability of Eros?] Chance and design both fail as solutions to the problem of statistical improbability, because one of them is the problem, and the other one regresses to it. *Natural selection is a real solution. It is the only workable solution that has ever been suggested.* And it is not only a workable solution, it is a solution of stunning elegance and power. (italics added)

Since Dawkins is talking about "faulty logic", we can best put Wilber's argument in the form of a syllogism:

- Science tries to explain evolutionary emergence with chance.
    - Chance is not capable of explaining evolutionary emergence.
    - Therefore, something other than chance is needed (i.e. Eros).

The first premise is false, and so is the conclusion (the second premise is true, but irrelevant).

Compare this to Dawkins'syllogism—fully based on scientific facts:

- Evolutionary theory is based on chance and natural selection.
    - Natural selection is capable of explaining evolutionary emergence.
    - Therefore, no other hypothesis is needed (i.e. Life, God, Spirit).

The alternatives "Eros" or "Oops", as presented by Wilber on the very first page of *Sex, Ecology, Spirituality* (1995, p. vi), to designate the spiritualist and reductionistic outlook on life, are therefore a case of a false dichotomy. By equating science with chance Ken Wilber presents a straw man argument.

*

Wilber then makes the following, strong statement about neo-Darwinism (Wilber 1996: 22-23):

The standard, glib, neo-Darwinian explanation of *natural selection*—absolutely nobody believes this anymore. Evolution clearly operates in part by Darwinian natural selection, but this process simply selects those transformations that have *already* occurred by mechanisms that absolutely nobody understands.

Compare this, for starters, with what *The New Encyclopaedia Brittanica* (1991, vol. XVIII, 859) says about the theory of evolution:

There is probably no other notion in any field of science that has been as extensively tested and as thoroughly corroborated as the evolutionary origin of living organisms.

Or another scientific source, called "Project Steve" (2008) in honour of the late paleontologist Stephen Jay Gould, which is quoted by Sarkar (2007: 166):

Although there are legitimate debates about the patterns and processes of evolution, there is no serious scientific doubt that evolution occurred or that natural selection is a major mechanism in its occurrence.

What "transformations" does Wilber have in mind here? We need to read out the quotation in full to grasp both what Wilber is trying to tell us, and how he is telling it—humorously, but misleadingly: [6]

Take the standard notion that wings simply evolved from forelegs. It takes perhaps a hundred mutations to produce a functional wing from a leg—a half-wing will not do. A half-wing is no good as a leg and no good as a wing—you can't run and you can't fly. It has no adaptive value whatsoever. In other words, you are dinner. The wing will work only if these hundred mutations *happen all at once*, in one animal—and also these *same* mutations must occur simultaneously in another animal of the opposite sex, and then they have to somehow find each other, have dinner, a few drinks, mate, and have offspring with real functional wings.

Talk about mind boggling. This is infinitely, absolutely, utterly mind-boggling. Random mutations cannot even begin to explain this. The vast majority of mutations are lethal anyway; how are we going to get a hundred nonlethal mutations happening simultaneously? Or even four or five, for that matter? But once this incredible transformation has occurred, then natural selection will indeed select the better wing from the less workable wing—but the wings themselves? Nobody has a clue.

For the moment, everybody has simply agreed to call this "quantum evolution" or "punctuated evolution" or "emergent evolution"—radically novel and emergent and incredibly complex holons come into existence in a huge leap, in a quantum-like fashion—with no evidence whatsoever of intermediate forms. Dozens or hundreds of simultaneous nonlethal mutations have to happen at the same time in order to survive at all—the wing for example, or the eyeball.

> So much is wrong with this "argument", if we can call it an argument, for it has all the characteristics of a straw man argument, in criticizing a point of view nobody actually holds, *not even Ken Wilber*, as we will see.
>
> Again, let's quote *The New Encyclopaedia Brittanica* (1991, vol. XVIII, p. 859) on the matter of eyes and wings:

Some conclusions [of evolutionary theory] are well established, for example... that natural selection, the process postulated by Darwin, explains the adaptive configuration of such features as the human eye and the wings of birds.

> For starters, Wilber does not seem to be aware that the example of the wing or the eyeball, and its evolutionary "impossibility", has been one of the classic objections since the days of Darwin—leading to the famous phrase "What Good Is Half a Wing?"—which have repeatedly been refuted. According to Sarkar (2007), even Intelligent Design defenders no longer use the example of the eye or the wing, knowing fully well that it is no longer valid. [7]
>
> As to punctuated equilibrium, a controversial theory proposed by Gould and Eldredge in the 1970s, which has become so famous among creationists because it seems to suggest Darwinism fails to explain it, Sarkar (2007: 73) comments:

Even if punctuated equilibrium is the pattern, the processes involved remain squarely within the modern framework of evolutionary theory.

By not informing his readers of both sides of the debate, or rather, of the way real scientists handle these questions, the layman-reader is left to trust Wilber on his word.

Ironically, in 1996, in the very year that *A Brief History of Everything* was published, Richard Dawkins (1997) published his *Climbing Mount Improbable*, mentioned before, which contains a full chapter on the evolution of the wing (see Chapter 4: "Getting Off the Ground", pp. 108-137). There's another chapter on eyes—or rather, the many different ways eyes have evolved in the course of evolution (see chapter 5: "The Forty-Fold Path to Enlightenment", pp. 138-198—sixty pages on this topic alone!). The above quote from *Brief History* disqualifies Wilber as an authority on biological evolution. He has misrepresented a major field of science. [8]

Paraphrasing the highly charged and emotional tone of Wilber's quote—"absolutely nobody believes this", "no evidence whatsoever", "nobody has a clue"—which may be appropriate in a popular book on spirituality but is misplaced in any academic setting—one may conclude that if there's currently one opinion that would justifiably be characterized with the statement "absolutely nobody believes this anymore" it would precisely be Wilber's notion that evolution is driven by Spirit or Eros...

After *Brief History* Wilber rarely if ever again touched on the topic of evolutionary theory, and only so when pressed by his students, most of which is posted on the Internet. So let's switch our focus to online communications about Wilber's (mis)understanding of evolutionary theory. Some online critics have characterized Wilber's view of evolution as "pop-evolutionism", the popular view that evolution displays an onward and upward trend, so alien to the scientific view of evolution (Markus, 2009). Others (Meyerhoff, 2006b; Chamberlain, 2006, 2007), have highlighted the lack of real engagement by Wilber of Darwin and neo-Darwinism, and the questions raised by the rare occasions in which he did.

ONLINE DEBATES

This rather authoritarian response to criticism is typical of Wilber. However, popularization never justifies misrepresentation.

The infamous eyes-and-wings quote from Wilber prompted a reply from professor of religious studies and a former fan of Wilber, David Lane (1996), which was timely, witty and relevant. It never received a reply from Wilber. Lane acutely highlighted Wilber's misunderstanding of evolutionary theory. Bringing in the relevant literature on the topic of eyes and wings, he commented:

Not only is Wilber inaccurate about how evolution is presently viewed among working biologists (remember Wilber says "absolutely nobody believes this anymore"—tell that to the two most popular writers on evolution today) but he is just plain wrong in his understanding of the details of how natural selection operates. One can only wonder how well he has read Darwin, or Gould, or Mayr, or Dawkins, or Wilson, or even Russell. None of these individuals would agree with Wilber's assessment.

And on Wilber's allusion to the work of Gould and Eldredge on "punctuated equilibrium":

Now, no doubt, Gould and Eldredge have postulated a "speedy" version of Darwinian evolution (punctuated equilibrium), but they are not saying what Wilber suggests: that something mystical is going on. Rather, it just happens that if evolution is mostly a slow dance, there occasionally arises moments for some techno hip-hop.... Yet throughout it all the feet are doing the moving, not some trans-rational force....

Actually, according to Eldredge (2000), environmental changes are "what drives evolution".

Lane concludes his review, commenting on the tone used by Wilber to convince this readers:

What makes Wilber's remarks on evolution so egregious is not that he is more or less a closet creationist with Buddhist leanings, but that he so maligns and misrepresents the current state of evolutionary biology, suggesting that he is somehow on top of what is currently going on in the field. And Wilber does it by exaggeration, by false statements, and by rhetoric license.

Though Lane was very quick to reply to *Brief History*, Wilber chose not to respond to this particular criticism. One can only wonder why he has chosen this strategy. For a full decade no debate on these issues ensued.

Since his students *did* read these online criticisms, Wilber could no longer avoid the issue (see Anon., 2005a). In one reply on his own members-only Integral Naked forum, which was reposted

on the public blog "Vomitting Confetti" (Anon., 2005b), Wilber stated:

I know evolutionary theory inside out, including the works of Dawkins et al. The material of mine that is being quoted is extremely popularized and simplified material for a lay audience.

This rather authoritarian response to criticism is typical of Wilber. However, popularization never justifies misrepresentation. In fact, there are many popularized accounts of evolutionary theory out there these days (Coyne 2009, Dawkins 2009), but none would be guilty of this error. And if Wilber knows evolutionary theory "inside out", this is not reflected in his published writings.

Wilber continues:

Publicly, virtually all scientists subscribe to neo-Darwinian theory. Privately, real scientists—that is, those of us with graduate degrees in science who have professionally practiced it—don't believe hardly any of its crucial tenets.

Again, the phrasing is so drenched in absolutes—"virtually all", "hardly any"—that it is difficult to take these statements (the only ones we have to know Wilber's recent views on evolution) seriously. Also, it is an example of psychic, mind-reading kind of scholarship. Nor can Wilber be called a practicing scientist...

Instead of a religious preacher like Dawkins, start with something like Michael Behe's *Darwin's Black Box: The Biochemical Challenge to Evolution*. And then guess what? Neo-Darwinian theory can't explain shit. Deal with it.

This is about the only instance where Wilber actively recommends an author representative of Intelligent Design. Does Behe's book lead to the conclusion that "Neo-Darwinian theory can't explain shit"?

From the Wikipedia entry on Michael Behe:

Behe's claims about the irreducible complexity of essential cellular structures are roundly rejected by the scientific community. The Department of Biological Sciences at Lehigh University, Behe's academic home, has published an official statement which says "It is our collective position that intelligent design has no basis in science, has not been tested experimentally, and should not be regarded as scientific."

The major weakness of creationist accounts of evolution is that they lack an alternative theory.[9] For what does Wilber actually suggest? That God creates rudimentary wings, and that natural selection takes it from there? It leads to the awkward and arbitrary situation that living organisms are a combination of naturally evolved parts together with other parts which are the result of some kind of Divine intervention. [10]

Indeed, if anything applies here it is that "nobody has a clue".

In the blog posting mentioned above, Wilber (Anon., 2005b) makes another curious statement:

But overall integral theory doesn't hang on that particular issue. If physicalistic, materialistic, reductionistic forces turn out to give an adequate explanation to the extraordinary diversity of evolutionary unfolding, then fine, that is what we will include in integral theory. And if not, not. But so far, the "nots" have it by a staggeringly huge margin.

I do question the independence of integral theory from the specifically spiritualist view of evolution Wilber proposes. What if evolution turns out not to be a process "from lower to higher", driven by Spirit? No evolution, no involution. No involution, no Spirit. And no Spirit, no "Eros in the Kosmos".

Again, Wilber alludes to the matter of statistics, so we will conclude with some comments in that area. Concerning Fred Hoyle's estimation of the extreme unlikelihood of the origin of life by chance—whatever that may mean—a lot more can be said.

Dawkins (1985), for example, has called it a "memorable misunderstanding" (Korthoff, 1999), since evolution simply does not work the way Hoyle describes, but in small and incremental steps. It has even been honored with the expression "Hoyle's Fallacy" (Wikipedia):

Hoyle's fallacy, sometimes called the junkyard tornado, is a term for Fred Hoyle's flawed statistical analysis applied to evolutionary origins. Hoyle's Fallacy is a surprisingly easy mistake to make when one has not quite grasped how powerful a force natural selection can be. Hoyle's fallacy predates Hoyle and has been found all the way back to Darwin's time.

Musgrave (1998) gives a lot of helpful hints to solve this mystery, in his essay "Lies, Damned Lies, Statistics, and Probability of Abiogenesis Calculations".[11] He concludes:

At the moment, since we have no idea how probable life is, it's virtually impossible to assign any meaningful probabilities to any of the steps to life...

*

When the topic of evolutionary theory was discussed at Integral Institute in 2006, Wilber (quoted in Visser 2007a) clarified his position regarding Intelligent Design and theistic views of evolution saying:

You either postulate a supernatural source of which there are two types. One is a Platonic given and one is basically theological—a God or Intelligent Design—or you postulate Spirit as immanent—of course it's transcendent but also immanent—and it shows up as a self-organizing, self-transcending drive within evolution itself. And then evolution is Spirit's own unfolding. Not a super-natural, but an intra-natural, an immanently natural aspect. And that's basically the position I maintain.

One can, however, ask: what difference does it make in practice to have a transcendent or an immanent Eros when it comes to science? From the standpoint of science both are out of scope—"meta" or "intra" mean the same thing. Is "intra-physical" a physical notion? Then no physicist, (or perhaps only a New Age quantum physicist, cf. Amit Goswami, *Creative Evolution*, 2008), would subscribe to it. Or is it "meta-physical"? Then what's the point of calling these ideas "post-metaphysical" (Wilber's latest intellectual phase)? Isn't all of science *supposed* to be post-metaphysical from the start? This version of Wilberian "post-metaphysical *intra-physics*" hasn't been thought through sufficiently enough to make sense (Visser 2006, Chamberlain, 2006, 2007).

Again, in 2006, Wilber (2006b) clarified his position further in a blog posting on his own website www.kenwilber.com:

Do I think Mayr or Dawkins or Lewontin or Kauffman believe in telos or Eros that is Spiritual in any way? Absolutely not. Virtually all mainstream theorists embrace scientific materialism.

I am simply saying that most mainstream biologists accept that there are problems and issues at the leading edge of their science, and I am saying that I recognize the same leading-edge problems that they do, but at that point we quickly part ways—virtually all of them believe those issues can be fully solved using scientific materialism, and I of course do not accept that...

Would such a position really help science solve any of the "problems and issues at the leading edge" of biology? I don't think so. Isn't it essential to science that this leading edge continuously recedes back like a horizon, the more science proceeds?

*

And finally, in 2007 Wilber (quoted in Visser 2006—updated in 2007) posted an email exchange with Alexander Astin on his blog[12] , in which he returned to the notorious passage from *Brief History* about eyes and wings, declaring these examples to be meant purely in a metaphorical sense:

I have no belief whatsoever that the wing actually took 100 mutations [flatly contradicting his statement in *Brief History*: "The wing will work only if these hundred mutations *happen all at once*", a fine example of Wilber-speak]—that's just a way to state... more generally, that the complex forms of evolution that we see—such as the immune system—are not the products of mere chance mutation and natural selection. Rather, there is a force of self-organization[13] built into the universe, and this force (or Eros by any name) is responsible for at least part of the emergence of complex forms that we see in evolution.

Again, the absolutist and casual style is striking. And how are we to respond to statements made by Wilber on science, when they are taken back a decade later, without acknowledging they were a mistake? And if now the human immune system features as a test case for a spiritual theory of evolution, are we to take this merely as a metaphor too, as soon as science discovers how it actually evolved?

We need not look very far... From Richard Dawkins' *The God Delusion* (2006: 159-160), in which we meet our friend Michael Behe again:

Another of Behe's favorite alleged examples of 'irreducible complexity' is the immune system. Let Judge Jones himself take up the story:

'In fact, on cross-examination, Professor Behe was questioned concerning his 1996 claim that science would never find an evolutionary explanation for the immune system. He was presented with fifty-eight peer-reviewed publications, nine books, and several immunology textbook chapters about the evolution of the immune system; however, he simply insisted that this was still not sufficient evidence of evolution, and that it was not "good enough."'

Behe, under cross-examination by Eric Rothschild, chief counsel for the plaintiffs, was forced to admit that he hadn't read most of those fifty-eight peer-reviewed papers....

But Wilber concludes his reply to Astin with unshaken confidence:

So, no, I don't take this criticism of my work seriously, although it is a good example of flatland thinking.[14]

I rest my case...

So, let me get this straight...

Ken Wilber has engaged neo-Darwinism basically only once in his complete oeuvre spanning three decades and twenty plus books, by giving specific examples of organized complexity, such as eyes and wings, that supposedly cannot be explained by natural selection (contrary to what leading scientists such as Dawkins spell out to the public at that same time). And now, a full decade later, these biological examples are to be understood in a purely *metaphorical* sense, merely illustrating the "extraordinary capacity of creative emergence that is intrinsic to the universe"? Has science turned into poetry?

So Wilber doesn't even *try* to make his case in the arena of science?

One is sadly reminded of Sir Peter Medawar's (1961) devastating review of Teilhard de Chardin's *The Phenomenon of Man*, in which he wrote: "it is the style that creates the illusion of content"... In this context, Medawar also wrote: "its author can be excused of dishonesty only on the grounds that before deceiving others he has taken great pains to deceive himself."

*

In 2009 IntegralLife.com featured a video on evolution, in which Wilber (2009) kept repeating his ideas for an audience of eager students. From this members-only video:

Science is helpful with phenomena once they have arisen, but is unable to explain phenomena when they appear for the first time.

> I consider this view to be the result of lazy thinking and in the end harmful (Visser 2009a). It does not explain anything. It is anti-discovery. It makes an easy and arbitrary division between on the one hand "reductionistic" science, which does its own job of clarifying the details of nature, and on the other hand, "evolutionary" spirituality, which "explains" evolution and provides an inspiring worldview of growth and development.
>
> In the end, Ken Wilber is faced with the same dilemma as the Intelligent Design-adherents. The moment he declares that some phenomenon (in his case: the evolution of eyes and wings) cannot "possibly" be explained by Darwinian principles, he is vulnerable to every new discovery by science, which demonstrates that it can be explained that way after all. This often takes only a few years, as Behe has found out to his own dismay. (Coyne, quoted in Visser 2009b).
>
> As Sarkar (2007: 96) comments after his balanced assessment of Behe:

> [T]he conceptual issues that Behe raised, however intractable they may have seemed to him in the 1990s, have increasingly been resolved by empirical work in molecular evolution. What is troublesome—if the pursuit of knowledge is one of our salient goals—is that ID creationists have not modified Behe's original claims (at least in public). This attitude is not acceptable for any serious scientific claim, though it may be so if ID [or Wilber's philosophy] is to be taken as a theological thesis.

> In summary, Wilber's statements in this field have been less than helpful. He echoes objections to evolution from creationist corners, but never provides enough details to be convincing. And when he finally does give details, he retracts them a decade later in what has been, above all, a rather lame and inauthentic reply—by not taking ownership of extreme statements on evolution done in the past and turning everything into metaphor.[15]

CONCLUSIONS

- Ken Wilber and/or the integral community have missed an opportunity last year to join the worldwide debate on the relevance of Darwin and neo-Darwinism, and its

relationship to spirituality, including the Intelligent Design approach.

- Ken Wilber has not made a strong case yet for his "theory" of spiritual evolution. It lacks scientific grounding, echoes sentiments from creationists, and is unclear, biased and highly selective in its formulations. It lacks a true engagement with science.
- By not being responsive to online criticism directed at this theory, Ken Wilber has not lived up to the ideal of Habermasian "communicative rationality", in which viewpoints are freely exchanged in search of the best arguments. Nor has he taken responsibility for extreme statements on neo-Darwinism done in the past, when confronted with criticism. He has misrepresented a major field of science in a less than respectful way.
- And finally, though this talk had as its manifest subject Ken Wilber's views on evolution, it's hidden subject has been—as you may have guessed—why has it been so extremely difficult to discuss these matters within the integral community? Openness to criticism and public debate are the hallmarks of science and philosophy.

I would therefore like to give the last word to John Stuart Mill (1863: 17), from his treatise on liberty:

In the case of any person whose judgment is really deserving of confidence, how has it become so? Because he has kept his mind open to criticism of his opinions and conduct. Because it has been his practice to listen to all that could be said against him; to profit by as much of it as was just, and expound to himself, and upon occasion to others, the fallacy of what was fallacious.

Thank you very much.

NOTES

[1] Note the qualification added by Wilber "the facts of evolution as we understand them". We will focus today on precisely this understanding, or misunderstanding, of "the facts of evolution" as they are presented by Ken Wilber. Note also the casual style of this statement, "plenty of room for a Kosmos of Eros", which, as we will see is a pervasive aspect of his writing style. Pleasant for the reader, no doubt, but problematic when a more academic analysis is called for.

[2] To give one prominent example from the field of Theosophy: H.P. Blavatsky, who might be called the mother of Intelligent Design, graphically wrote in her *The Secret Doctrine* (1888, II, 52): "Nature, unaided, fails". She was one of the first to publically oppose Darwin from a spiritualist point of view, looking for a kind of "third way" in trying to stay clear from both dogmatic creationism and materialistic science. She held, among other things, that Darwin was not so much wrong as partial ("Occultists themselves are ready to concede partial correctness to the Darwinian hypothesis"), that evolution was driven by a Divine force (called the Logos), and that a universe of chance should be replaced by a universe of purpose ("nature is not a fortuitous concurrence of atoms"). Views quite similar to Wilber's. Contrary to Wilber, she entered into a lively debate with Darwin, even if only in print. In her *The Secret Doctrine* Darwin or Darwinism is mentioned over 200 times. Another spokesman of this Theosophical lineage phrased it in a kindred way (Lester Smith, 1990):

The ordered complexity of living things certainly is suggestive of intelligent design. Indeed, the entire universe gives eloquent testimony of being a product of mind and intelligence, as some scientists have maintained. Yet, under the sway of a contemporary fashion, most of them disregard the logical requirement for a source of order and believe that creative intelligence is the last thing to emerge, merely a culmination of a long series of fortunate accidents conserved in evolution. Let us reverse this hypothesis and suppose that intelligence is primal, that the cosmos is grounded in and pervaded by intelligence.

[3] Initially, in the form of the Great Chain of Being, it was decidedly perennialist, and therefore metaphysical in context—interpreted by Wilber rather abstractly as *levels* instead of the various *beings* of the *scala naturae*, as it was traditionally understood. Lately it has been recast in a so-called "post-metaphysical" framework—though not entirely non-metaphysical, as we will see.

[4] Also, the scientific or "reductionistic" view of evolution is best seen as a Null-hypothesis:

The apparent design in nature can be explained without invoking some kind of Designer [Read: Spirit, Logos, Eros, Force, Power, Mind, God]. (Visser 2009a)

This Null-hypothesis has to be tested thoroughly, before we turn to an alternative hypothesis, as formulated by Wilber, on various occasions:

[T]he strict theory of natural selection suffers from not acknowledging the role played by Spirit in evolution. (Wilber 1983: 205).

The proper approach should be to present the scientific, "reductionistic" view on evolution as strongly as possible. Unfortunately, in Wilber's writings this is far from the case. Two mistakes can be made here: (1) the Null hypothesis is never rejected and (2) the Null hypothesis is rejected too soon. Ken Wilber seems to be guilty of the second mistake.

[5] In a footnote he also gives a statistical reason for his belief in a cosmic Force driving evolution:

Recent evidence [no source] suggests 7-9 billion years for the Big Bang, which makes it even more difficult to account for emergent evolution with statistical probabilities. Scientists used to say that because evolution had a virtually unlimited amount of time, the emergence of higher life forms and man could easily be explained by statistical likelihoods. That unlimited time was drastically reduced by the strong evidence of a 15-billion-year limit, a limit that severely (and in the opinion of some, fatally) strained probability figures. Cutting that limit in half will, I predict, completely destroy that statistical argument, which will leave science unable to account for the how or why of evolution. I.e. there is a "force" driving evolution that far outdistances statistical probabilities—and that force is Atman telos [Eros]. (Wilber 1981: 304)

We will return to this topic of statistics later in this talk. But please note that current estimates from NASA of the age of the universe still give 13.7 billion years (Wikipedia).

[6] Wilber takes the same stance here as the notorious Bishop Samuel Wilberforce (what's in a name?), who tried to silence one of the first public debates about Darwin's *Origin of Species* by ridiculing the theory and his opponent (Thomas H. Huxley). When asked if he really thought he was descended from a monkey, Huxley's legendary answer was, as reported by a newspaper (Sidgewick, 1898):

He was not ashamed to have a monkey for his ancestor; but he would be ashamed to be connected with a man who used great gifts to obscure the truth.

In my opinion, if one has to resort to ridicule, in a scientific or philosophical debate, one has already lost the argument...

[7] To give only one recent rebuttal, taken from a random online source, a "Pseudo-science" webpage hosted by Steven Dutch:

One problem with the half-a-wing criticism is that it ignores exaptation, the adaptation of a trait originally developed for one function to some other function. But apart from exaptation, the half-a-wing criticism is completely false.

Actually, half-formed eyes and wings can be very useful. Any light-detecting ability, however rudimentary, will enable an organism to seek shelter, find food, and avoid predators. Similarly, half-formed wings aren't as useless as often imagined. The idea that eyes and wings can only function if fully formed is completely false. Indeed, it's a lot easier to see how partial versions of these organs could function than it is for many other organs. Creationists assume that problems in evolution are insoluble without making even the slightest attempt to see if solutions exist. (Dutch, 2002)

[8] In *River out of Eden*, published around the same time, Richard Dawkins (1996, quoted in Lane, 2006) turns again to the topic of the evolution of the eye, this time backing his statements up with references to recent researches into the evolution of the eye, and the surprisingly short timespan needed to get this done:

Thus the creationist's question—"What is the use of half an eye"?—is a lightweight question, a doddle to answer. Half an eye is just 1 percent better than 49 percent of an eye, which is already better than 48 percent, and the difference is significant. A more ponderous show of weight seems to lie behind the inevitable supplementary: "Speaking as a physicist, I cannot believe there has been enough time for an organ as complicated as the eye to have evolved from nothing. Do you really think that there has been enough time?" Both questions stem from the Argument from Personal Incredulity. Audiences nevertheless appreciate an answer, and I have usually fallen back on the sheer magnitude of geological time. If one pace represents one century, the whole of Anno Domini time is telescoped into a cricket pitch. To reach the origin of multi-cellular animals on the same scale, you'd have to slog all the way from New York to San Francisco.

It now appears that the shattering enormity of geological time is a steamhammer to crack a peanut. Trudging from coast to coast dramatizes the time available for the evolution of an eye. But a recent study by a pair of Swedish scientists, Dan Nilsson and Susanne Pelger, suggests that a ludicrously small fraction of that time would have been plenty. When one says 'the' eye, by the way, one implicitly means the vertebrate eye, but serviceable image-forming eyes have evolved between forty and sixty times, independently from scratch, in many different invertebrate groups....

[9] Dutch (2008) even starts his review of Behe's book:

How do you review *nothing*? Michael Behe's Darwin's Black Box is a touchstone of the Intelligent Design movement. Criticize Intelligent Design and you'll be told "Oh, you need to read Michael Behe." Well, here it is. I've read Behe, and nowhere in his book is there a *single* scientific statement in the sense of something that can be tested.

> In his review of Behe's Darwin's Black Box Dutch biologist Korthof (1997) takes another approach. Behe in fact argues that some cases—the blood clotting system, or the bacterial flagellum, but not eyes or wings—of what he calls "irreducible complexity" can't be explained by Darwinian theory. Korthof takes the position that this amounts to a potentially valid falsification of Darwinism, irrespective of what motives or theological convictions Behe might have.
>
> Actually, Darwin himself invited critics to actively look for these instances. If phenomena can be found that display irreducible complexity, Darwinism is refuted (for these cases, but not for others). However, if these phenomena turn out to be not irreducibly complex, Darwinism wins. The trouble with these attempts at refuting Darwinism, are that again and again, as science proceeds, it does find ways to explain the seemingly unexplainable (or find "reducible complexity", Adami, 2006).
>
> [10] Paul Davies (1999) has alerted us to the fact that life isn't just a matter of complexity, but of *specified* complexity (see also Dembski, 1998), in this case , spelled out and mediated by DNA. A simple push, however "gently", will not do here. According to Korthof (1997), invoking a Designer to explain complex organs or organisms is a "scientific dead end", because there is no way we could understand the ways of working of this Designer.
>
> [11] Musgrave writes: "Every so often, someone comes up with the statement "the formation of any enzyme by chance is nearly impossible, therefore abiogenesis is impossible". Often they cite an impressive looking calculation from the astrophysicist Fred Hoyle, or trot out something called "Borel's Law" to prove that life is statistically impossible. These people, including Fred, have committed one or more of the following errors:

1. They calculate the probability of the formation of a "modern" protein, or even a complete bacterium with all "modern" proteins, by random events. This is not the abiogenesis theory at all.

2. They assume that there is a fixed number of proteins, with fixed sequences for each protein, that are required for life.
3. They calculate the probability of sequential trials, rather than simultaneous trials.
4. They misunderstand what is meant by a probability calculation.
5. They seriously underestimate the number of functional enzymes/ribozymes present in a group of random sequences.

[12] Astin had read one of my blogs titled "Eros or Oops?" (Visser 2007b), which questions this dichotomy, so prevalent in Wiber's works, and pointed to David Lane's essay on evolution, as reposted on Integral World. The two gentlemen fully agree on the low value of the material found there, but apparently Astin couldn't help reading some of it (as a kind of integral pornography). In one of the rare cases in which Wilber has tried to reply to criticism directed at his (mis)understanding of evolutionary theory, he clarifies his view on evolution as:

The following is his response to a recent criticism which suggests that I don't understand evolution because I don't understand that previous individual mutations are carried forward—but of course I understand that, it's evolution 101 (in which I have a graduate degree!—the biochemistry of evolution). But my point lies in a different direction, which is what these critics miss: the necessity of a self-organizing force (or Eros) intrinsic to the universe.

As the current paper argues, the necessity for Eros depends wholly on a misrepresentation of the scientific view of evolution.

[13] The concept of self-organization is ambiguous. Either there's an external force molding matter into organisms (as in vitalism); or matter is "self-organizing'(and therefore self-sufficient)—but "a force of self-organization" which "is responsible for at least part of the emergence of complex forms"? One is tempted to ask, which part? It is telling that Kauffman calls his approach a "physics of biology" (1993: 641)—hardly a transcendental programme... But if even Kauffman (1993) doesn't buy Wilber's theory of Eros, who will?

[14] In their email exchange Wilber and Astin again raise the age-old issue of the survival value of "half a wing". Astin naively

> remarks: "Does the half-wing make them run faster?". Wilber concurs by replying:

Also, as you point out, referring to random chance really means "I have no idea what is going one here"—and that is really what, in *Sex, Ecology, Spirituality*, I call the "philosophy of oops," as you rightly note. This is a huge hole in the mere chance and selection argument. These items are all meant when I use the metaphor of a 100 mutations. I am fully aware that selection carries forth each previous selection (which still has problems in itself—as you point out, why would a half wing make running easier???), but even if you give that to the evolutionists (which I am willing to do), it still has this gaping hole in it.

> Why would half a wing make running easier? Any popular scientific source can provide an interesting answer. For example (American Institute of Biological Sciences, 2006):

An article by Kenneth P. Dial and two co-authors in the May 2006 issue of *BioScience* summarizes experimental evidence indicating that ancestral protobirds incapable of flight could have used their protowings to improve hindlimb traction and thus better navigate steep slopes and obstructions. By using their protowings in this way, they would presumably have had an advantage when pursuing prey and escaping from predators.

Dial and colleagues performed experiments on several species of juvenile galliform (chicken-like) birds, concentrating on chukar partridges. Chukars can run 12 hours after hatching, but they cannot fly until they are about a week old. Even before they are able to fly, however, the birds flap their developing wings in a characteristic way while running, which improves their ability to climb steep slopes and even vertical surfaces. Dial and colleagues have named this form of locomotion "wing-assisted Iincline running" (WAIR). After they are able to fly, chukars often use WAIR in preference to flying to gain elevated terrain, and exhausted birds always resort to WAIR.

Dial and colleagues describe experiments showing that if the surface area of chukar wings is reduced by plucking or trimming the feathers, WAIR becomes less effective for climbing slopes. Dial and colleagues propose that incipiently feathered forelimbs of bipedal protobirds may have provided the same advantages for incline running as have now been demonstrated in living juvenile birds. Their work thus supports a new theory about the evolution of flight in birds. WAIR, which the authors believe to be widespread in birds, appears to offer an answer to the question first posed by St. George Jackson Mivart in 1871: "What use is half a wing?

> [15] And what exactly is the "novelty" that evolutionary theory supposedly fails to account for? Telling enough, this is never specified in Wilber's talks and writing. An eye? A wing? A horse? A dinosaur? Fish getting onto land? Where exactly does science fail and is it in need of a spiritual hypothesis? If this isn't specified, everything becomes meaningless. The pathos in which Wilber writes about evolution is misplaced, as is the casualness

of Wilber's pronouncements on evolutionary theory throughout his entire writing career. (Visser 2009a). Ken Wilber seems content with the circularity involved when novelty is explained by... postulating novelty, creativity by... creativity, spirituality by... spirituality. Science, if anything, tries to avoid such circularities. To Ken Wilber, presenting his "theory" of spiritual evolution driven by Eros to science, a current day evolutionary theorist would probably just say: I have no need of such a hypothesis...

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KEN WILBER'S PROBLEMATIC RELATIONSHIP TO SCIENCE

FRANK VISSER

Abstract: Ken Wilber has argued for a spiritual view of evolution. To make his case he has defended three knowledge claims: (1) current science fails to explain major transformations in evolution, (2) some scientific views seem to support his view that the cosmos is inherently creative, and (3) his own theory of evolution is "the only theory that can actually explain the mysteries of evolution." The validity of these three claims is questioned by the argument that a more believable integration of evolutionary theory within integral theory is called for. This requires both an openness to criticism and more solid expertise in this specific field of science. Thus far, both of these features have been lacking within both Wilber's writings and the integral community.

Keywords: Eros, evolution, evolutionary science, extended synthesis, integral theory, modern synthesis.

INTRODUCTION

Here, I propose a more systematic and analytical treatment of the areas where Wilber and evolutionary science meet—or don't meet.

Throughout his many works, Ken Wilber has shown an ambiguous attitude towards science, and especially evolutionary science. Even though the concept of evolution has been central to his entire work spanning four decades, his engagement with evolutionary theory has been minimal. He has often argued science can't explain some forms of complexity. He has suggested his ideas are like those of some famous scientists, seeming to suggest they implicitly support his ideas. At the same

time, he has explicitly denied that these scientists would accept his specific idea of evolution as Spirit-in-action, metaphorically pictured as Eros-in-the-Kosmos. And finally, he has claimed to have “the only theory that can actually explain the mysteries of evolution” (Wilber, 2017, p. 14), even though his mystical notion about Eros doesn't qualify as a scientific theory. In sum, the interface of integral theory with evolutionary science needs much more thoughtful consideration than it has received until now.

In 2010 I presented the paper “The 'Spirit of Evolution' Reconsidered” at the Integral Theory Conference, where it received an honorary mention in the category of constructive criticism. It reviewed in chronological order the most salient written and online statements Wilber has made about evolution and evolutionary theory (Visser, 2010). Over the years I have offered the more critical reviews in dozens of essays on Integral World (Visser, 2008). Here, I propose a more systematic and analytical treatment of the areas where Wilber and evolutionary science meet—or don't meet. Wilber has given four reasons for taking a spiritual perspective on evolution. In his recent *The Religion of Tomorrow* he argued, among other things:

Rational reasons to believe in this miraculous spiritual dimension to Reality include the following: (a) the "creative advance into novelty" that is demonstrated by evolution itself and is inexplicable by mere "chance mutation" (the evolution from strings to quarks to subatomic particles to atoms to small molecules to massively interconnected molecules to asexual cells and early organisms—just for starters—is an awful lot of evolution in a universe that is supposed to be "running down" but can easily be seen as yet more evidence of creative Eros or Spirit-in-action, "a self-organizing self-transcendent drive," as Erich Jantsch put it). (Wilber, 2017, p. 498)

The other three areas involve the interconnectedness of things and events, the presence of consciousness and the evidence from meditation. This quote reveals a number of problematic claims. First, the grand sequence from sub-atomic particles to complex biological organisms is taken as *prima facie* evidence for a Spirit behind everything. Second, doubt is cast on the commonly accepted view in science that the second law of thermodynamics, according to which the universe is “running down” holds sway, apparently in contradiction to the increase of complexity Wilber refers to. And third, this cosmic process is

explained, quoting complexity scientist Jantsch, by a generic "drive" towards self-organization and self-transcendence.

In my view, the growth towards complexity can be explained more fruitfully by closely paying attention to what science has to say about each of these transformations. Chance is only one of the many factors involved. Further, this growth towards complexity does not violate the second law but is paradoxically powered by it through the energy flows it continuously generates. And finally, postulating a generic drive towards complexity (or behind biological evolution) leads to more questions than it answers. Why, for example, would that drive work well on Earth but not on the Moon or Pluto, if Eros is a cosmic phenomenon? And why, for that matter, did it take billions of years before even on Earth complex life arose? Science provides more believable explanations for these processes.

We can contrast a religious with a scientific view of reality like this. In the religious view, taken by Wilber, one feels overwhelmed by the complexity of nature and invokes a metaphysical principle (Spirit) to explain it all. Before exploring reality, one already knows the final answer. Science comes down from that "view from 40.000 feet" and breaks up this problem in more manageable chunks. It does not pretend to have final answers but makes daily progress in solving these piecemeal problems. Invoking Spirit to solve problems of science is a non-starter, a question-begging strategy, the "God of the gaps." When one argues for Spirit, it is important to find areas where science supposedly fails, as much as areas where science can be included. Even a creationist will accept that minor variations are possible during evolution. It is major transformations that are usually seen as problematic within the current status of science. This is Wilber's stance as well (Wilber, 1995, p. 10, 492).

On many occasions Wilber has expressed doubts about the ability of science to solve the mysteries of evolution—so that it needs to be complemented by a spiritual perspective. Here's an example from a recent Integral Life video (Wilber & De Vos, 2019):

One of the most *boring* criticisms I have received over the years is that my theory doesn't fit the modern theory of evolution. And that's right! The modern theory of evolution is catastrophically incomplete!

> A strong statement such as this leaves me to wonder, if, to make this field of evolutionary science "more complete," we are supposed to add Spirit to our worldview, or if we rather should really investigate what current evolutionary theory entails. A similarly strong statement about the incompleteness of science was made in a blog post by Wilber in which he responded to criticism about this understanding of evolution (Wilber, 2006b):

Do I think Mayr or Dawkins or Lewontin or Kauffman believe in telos or Eros that is Spiritual in any way? Absolutely not. Virtually all mainstream theorists embrace *scientific materialism.*

> This, again, makes me wonder, if Wilber's view of evolution is in fact not supported by science at all. Yet on occasion, as I will show, he claims support from famous scientists. However, in general one cannot claim support from thinkers that do not share one's particular views. Personally, I would worry when the view of evolution I hold is not supported by science, but Wilber apparently thinks otherwise. He indicates his reliance on other ways of knowing, based on his own mystical readings or meditative experiences (generally phrased by him as the "Eye of Spirit").
>
> But in general, when one invokes an extra-scientific principle to explain the complexities of nature, one surely has the burden of proof to show that this explanation really clarifies things. As is the case with the God of the creationists, this is fundamentally impossible. Wilber's spiritual-mystical views on evolution suffer from the same fundamental drawbacks, in my opinion.
>
> To see more clearly where Wilber and science meet, or part ways, we need to see what Wilber's view of evolution actually consists of. Then we need to see if evolutionary science speaks with a single voice about evolution or many different (and sometimes conflicting) voices. And finally, we need to see if there is common ground between these two areas.

KEN WILBER'S VIEW OF EVOLUTION

Where to begin? Why not at the beginning? In his first book, *The Spectrum of Consciousness*, Wilber (1977) pictured the cosmic process (following Coomaraswamy) as divided in two phases: evolution, or the movement from Spirit to maya (matter), and involution, or the opposite and subsequent movement from maya to Spirit. In later works he reversed these terms (following Sri Aurobindo), with involution being the prior movement from Spirit to maya and evolution being the opposite and subsequent movement from maya to Spirit. (Wilber, 1993, p. xviii-xix) However, the basic abstract scheme remains the same: All natural processes come from Spirit and return to it, whichever name we give to its phases.

Spirit therefore plays a crucial role in evolution as Wilber understands it. This is clear from another early work, *Eye to Eye*, in which he states: "The strict theory of natural selection suffers from not acknowledging the role played by Spirit in evolution" (1983, p. 205). Further, the subtitle of *Sex, Ecology, Spirituality* (1995), his major academic work, is "The Spirit of Evolution," and in *A Brief History of Everything* (1996), a more popular version of this main work, Part One was specifically called "Spirit-in-Action." One can even say he believes in a certain view of evolution because he believes in the doctrine of involution.

This active view of Spirit differentiated the neo-perennial philosophy from its predecessor the Perennial Philosophy, according to Wilber. Where Spirit was traditionally depicted as the passive Ground of Being, without any clear notion of evolution, in this more recent formulation Spirit is seen as both passive and active at the same time: passive-transcendent as World Ground and active-immanent as World Process. This Neo-Perennialist view was rather recent, "no more than a few hundred years old" and its precise origin is "almost impossible to pinpoint exactly." It started with Hegel and Schelling, was taken up by Spencer and "applied to biology" by Darwin, before reappearing in Sri Aurobindo and Teilhard de Chardin, in Wilber's reading of the history of evolutionary thought (1997, p. 62-63).

In Wilber's reading of the evolutionary literature, Charles Darwin didn't do much more than "dutifully and drudgingly" (Wilber's

words) accumulate evidence for a view of evolution that was already “in the air” (Wilber, 1995, p. 491). What Wilber failed to realize, is that Darwin fundamentally *broke* with the prevailing notions about evolution, in a way that was shocking to many of his contemporaries, even to those who accepted the theory of natural selection. Darwin replaced the concept of transformation or transmutation, as evolution was called in those days, by the theory of variation and selection (Visser, 2019d). And where Wilber (1995, p. 491) concludes in *Sex, Ecology, Spirituality* that Darwin's lasting contribution was to obscure “for over a century” a spiritual view of evolution (driven by Eros or Spirit), for science his contribution was taken to be an enormous clarification of the evolutionary process (Visser 2019d). Wilber's concept of evolution is fundamentally at odds with that of science. It is here that Wilber's scholarship is most wanting and in need of a substantial correction.

Wilber's highly esoteric-idealistic view of evolution gets brief mention in the historical overviews of the idea of evolution. For example, Bowler (2009, p. 209), in his *Evolution: The History of An Idea*, does mention Goethe, Hegel, Fichte and Schelling in a brief paragraph on Idealism and Romanticism, and their reaction to Enlightenment materialism, in which they wanted to see “spirit as an active force imposing its will on nature to create order and purpose.” But nothing like the elaborate esoteric doctrines of involution and evolution can be found in the Western philosophical literature.

A more likely source therefore, is the Western-esoteric Theosophical tradition, which started in 1875 with H.P. Blavatsky and whose magnum opus *The Secret Doctrine* (1888) contained not only elaborate details about involution and evolution, but also dozens of references to Darwin. According to Indian scholar Meera Nanda (2010, p. 284) all these Eastern-esoteric philosophers are “Blavatsky's Children” (Visser, 2019c). She writes: “The entire repertoire of intellectual arguments used to dress up traditional Hindu cosmology in the scientistic costume of progressive evolutionism was created and popularized originally by Madame Blavatsky and her fellow Theosophists” (Nanda, (2010, p. 284). Theosophy revitalized Indian philosophy, but introduced ideas of its own, one of which were the elaborate cycles of involution and evolution. Meera emphasizes

specifically that these Hindu doctrines are incompatible with Western science.

What immediately stands out about these theories is how deeply and fundamentally they contradict Darwin. While Darwinian theory explains [the] evolution of species by descent from a common ancestor by genetic modification, Hindu teachings assume spirit or consciousness to be the primary force of evolution. Does it not follow, therefore, that one can't believe in the Hindu view of evolution, and in the same breath claim to be in accord with [the] scientific—i.e., Darwinian—understanding of evolution? (Nanda, 2010, p. 282)

This points to a fundamental theoretical difference Wilber tends to gloss over in his dealings with evolution. Integrating the Darwinian view of evolution has consequences for any spiritual view of evolution.

Of course, some contemporary thinkers have tried to forge an integration between these two opposing views, usually called theistic evolution, in the sense that evolution is God's way of creation, or that God fine-tuned the original conditions under which evolution could subsequently take off (Lazlo, quoted in Visser, 2014a). I have called this “the God of the Knobs” (Visser, 2019b). But I find these forms of synthesis or integration hardly convincing. They are parasitic on the scientific view because they never specify the added value of introducing Spirit. And what empirical data are proof for God's existence? This is the major weakness of Wilber's view of evolution: if there is such a pervasive cosmic force operative in evolution, as he claims, how could that possibly work in practice and be detected?

To repeat, traditional doctrines of evolution were “transformational” (or “transmutational” as it was expressed in the nineteenth century) to use Ernst Mayr's (2001) terminology, whereas Darwin's proposed a “variational” model of evolution. In the traditional view, species morphed into other species by a mysterious process of transformation or transmutation, whereas Darwin abolished such a notion in favor of variation, selection, and inheritance. Wilber is fond of using the terms “transcend-and-include” when dealing with evolutionary processes, which are supposed to be driven by Eros, a Whiteheadian “creative advance into novelty” or an “extraordinary power.” In a video on evolution Wilber (2014) claimed:

This seems to be the general overall thrust of evolution—and one of the things that is certain about it—is that it won't give up. It simply is there, with an extraordinary power, in the entire cosmos.

Scientists don't think in these generic and generalized terms about evolution at all. They want to precisely understand under what conditions complexity may or may not emerge.

There are only two basic options here, in my opinion. Either there is such a pervasive "drive" towards complexity in the cosmos, or there is not. If there *is*, one has to explain why, if we take our solar system as an example of a self-contained energetic unit, life seems to be so rare—as far as we can tell. Life on earth seems to be the exception to the rule, instead of the rule itself. But if there is *no* such cosmic and pervasive drive towards complexity, the task is to explain why there is life at all in our solar system. Science understandably points to the specific conditions that exist on Earth—the so-called "Goldilocks conditions" of the habitable zone in which our planet exists (Christian, 2018). The fact that life may exist outside of our solar system, and may even be abundant, does not change that observation. Invoking metaphysical principles should really be our last resort—if at all.

Incidentally, this does not mean that the scientific theory of evolution doesn't accept the notion of progress, as is often assumed, mostly because of Stephen Jay Gould's influential anti-progress arguments (Gould, 2002). However, both Ernst Mayr (2001) and Richard Dawkins (2003) have argued, persuasively, that natural selection was *bound* to lead to progress, under certain conditions, and in the restricted sense as being better adapted to the environment. What is not accepted by science is a general progressive movement in all departments of nature, least of all driven by an inherent force or pressure, let alone one of a spiritual or divine nature, as Wilber proposes. This latter conviction remains, in the words of Dawkins (2017, p. 124), a mystical doctrine which is "not really a theory at all, and I shall not bother to discuss it. It is obviously mystical and does not explain anything that it doesn't assume to start with." I agree with this assessment of the theoretical emptiness of these mystical notions. Wilber's notion of a Spirit-driven evolution (which can hardly be called a "theory") suffers from the same defect.

Does Wilber in fact *have* a proper theory of evolution? In his main work *Sex, Ecology, Spirituality* Wilber (1995, p. 35-78) has fleshed out his "Twenty Tenets," which he defined as "the 'laws' or 'patterns' or 'tendencies' or 'habits'" that "all known holons seem to have in common," (p. 34). Remarkably, in this long section those thinkers that get included are philosophers, psychologists, social scientists or complexity scientists, such as Whitehead, Derrida, Foucault, Freud, Marx, chaos theorists—but most notably absent are those who should be consulted first when it comes to evolution: evolutionary theorists. In fact, these Tenets are highly abstract descriptions, not causal explanations. As one example, tenet 3 reads "Holons emerge," which is to say that atoms give rise to molecules, as molecules give rise to cells, etcetera. That may be true at an abstract-descriptive level but doesn't contribute to our understanding of *how* exactly molecules and cells emerge from simpler holons. These processes are usually well understood by science and are non-mysterious.

In his more popular books or videos, Wilber has used a rather colloquial style of presentation to convey his understanding of evolution. Most of these dealings with modern evolutionary thought have been rather critical about mutation/variation and natural selection theory (Wilber restricts himself usually to neo-Darwinism). He usually questions that science can explain a certain form of complexity (be it human eyes, bird's wings, the immune system, regeneration, morphogenesis or speciation) without in any way engaging the relevant evolutionary research literature. More often than not, this criticism is couched in graphic and sarcastic statements, meant to cast doubt on the scientific, neo-Darwinian understanding of evolution. Here's a typical example taken from a video about Integral Buddhism.

To get one species from another requires several mutations. It's well-known that the vast majority of mutations are lethal, so we would have to have several extremely unlikely mutations all occurring at once in the same animal. But even more unbelievable, the exact same number and type of mutations would have to occur in another animal of the opposite sex, in order for them to procreate and pass on the new mutations. And even more unbelievable yet, these two would have to find each other—what if one is in Siberia and the other in Mexico? The odds of all of those happening is basically zero. (Wilber, 2014)

Science, however, explains speciation by populations being split in two parts, so the problem of its members being in two countries far apart simply does not arise (Coyne & Orr, 2004). How mutations spread within populations is well understood by the modern synthesis. Again, Wilber's understanding of the principles of evolution is inadequate and at variance with science. What does he actually have in mind, that Eros is tweaking genes? That Spirit is the Great Mutator? He does not tell us.

On more than one occasion, Wilber has pointed to the literature of intelligent design, which, he believes has correctly identified the shortcomings of neo-Darwinism, even though he disagrees with their alternative solution (of the Christian God). For example, in a footnote of *Integral Spirituality* he states,

I am no fan of intelligent design either, which is just Creation Science in drag. But you don't need an intelligent designer to realize that evolution seems to involve some "creative allure," or what Whitehead called "the creative advance into novelty." That drive—Eros by any other name—seems a perfectly realistic conclusion, given the facts of evolution as we know them. Let's just say there is plenty of room for a Kosmos of Eros. (Wilber, 2007a, p. 236n.)

What "facts of evolution" has Wilber taken into consideration, one wonders? Wilber's "integral design," as we can call it (Visser, 2009), suffers in my opinion from the same defects as intelligent design proper: it doesn't have a *positive* theory of evolution of its own. Apart from a generic "drive towards self-organization" no further details are provided. All it can do is cast doubt on science and its supposed shortcomings, but it cannot, by definition, get explicit about the ways of working of the divine Eros or Spirit.

As Shanks (2004) formulated it in his critique of intelligent design "theory": creationism (or intelligent design) cannot answer the crucial questions about the What, Who, How, When and Why of evolution. Wilber may not be a typical creationist (Visser, 2019), but he can with some justification be called a "creativist" (Visser, 2011). In Whiteheadian style, Wilber relates all evolutionary novelty to the "creativity" inherently present in the universe. This primordial creativity cannot be explained any further, other than identifying it as the "action" of the divine Spirit. As we will see, there are other, more believable ways to conceptualize the creativity of the cosmos.

A different way to contextualize Wilber's take on evolution is found in the magazine article "The Real Evolution Debate" (2007), which was published in *What Is Enlightenment?*, a Andrew Cohen related publication which served as medium for Wilber's ideas for many years. In it, no less than twelve approaches to evolution are portrayed, six from a material-scientific and six from a spiritual-religious perspective.

Table 1. Scientific and Spiritual Approaches to Evolution.

SCIENTIFIC	SPIRITUAL
1. Neo-Darwinists 2. Progressive Darwinists 3. Collectivists 4. Complexity Theorists 5. Directionalists 6. Transhumanists	7. Intelligent Designers 8. Theistic Evolutionists 9. Esoteric Evolutionists 10. Process Philosophers 11. Conscious Evolutionists 12. Integralists

It is argued by the anonymous author(s) that the evolutionary landscape is much more varied than the usual “Darwin vs. Design” dilemma, which dominates our public discourse. Wilber's integral philosophy, listed as the final and most comprehensive approach, is described as follows,

"The integralist's goal is not so much a new theory of evolution but a larger perspective that can effectively integrate disparate existing theories, both spiritual and scientific, into a coherent picture of the entire evolutionary process. More than synthesizers, they offer a sort of radically inclusive meta-theory, one that sees truth everywhere—from the gene-centered focus of the Neo-Darwinists to the mathematical insight of the Complexity Theorists to the creativity of the Process Philosophers—but attempts to provide a larger context that allows us to see the relationships between these many evolutionary perspectives… Like the Conscious Evolutionists and the Process Philosophers, the Integralists are reaching for a higher synthesis and a deeper integration between science and spirit." (p. 100).

Be that as it may, in my opinion the two basic options still remain: evolution is seen as either *unguided* (or naturalistic) or it is seen as *guided* (by whatever divine Principle, Process or Person). Wilber's Eros-in-the-Kosmos is such a transcendental Principle, which places him squarely in the religious-spiritual-mystical camp.

This raises the pertinent question: what is the added value of that "larger perspective" and "coherent picture" in terms of understanding evolutionary processes? For example, does a Whiteheadian "creative advance into novelty" qualify as a theory? Or does it provide any new understanding? Is it an improvement on what science has to offer, as Wilber claims? Can a meta-theory actually have any bearing at all on scientific problems? Wilber suggests a positive answer to this question by introducing the notion of Eros when discussing the evolution of eyes and wings, or other biological phenomena, but it is questionable.

Wilber claims to transcend-and-include science in his integral philosophy, but this leads to problems: evolution is either guided or unguided. Tertium non datur. Or put differently in more modern terms: you can't have it both ways. Species are either created or evolved. And if science is included to some extent by an integral philosophy, to what extent is it included? And more importantly: when is it transcended? Wilber does not provide any specifics here.

In summary, by introducing Spirit into the evolutionary equation Wilber doesn't clarify any single empirical evolutionary problem. He does on occasion refer to some areas of science, most notably complexity and chaos science, that seem to point into the direction of a creative cosmos, but we should keep in mind this in no way implies automatically there is a Spirit behind everything we see in nature. His attempts to cast doubt on the ability of science to explain these natural phenomena have not been very convincing to me, in part because his penchant for caricature and dismissive humor have not helped create an atmosphere for serious reflection.

WHAT DOES SCIENCE SAY ABOUT EVOLUTION?

Turning now to science itself, it should immediately be obvious there is not one single scientific theory about evolution—or about anything else within the province of scientific study, for that matter. Instead, there are various schools of thought, which debate intensely about the mechanisms of evolution, and more specifically the relative importance of natural selection. Most, if not all, however, subscribe to the Darwinian thesis that we do

not need to invoke spiritual forces to explain the diversity and complexity of nature--nor should we.

Of these evolutionary schools, Wilber usually refers only to "neo-Darwinism," which is a label applied to the so-called modern synthesis, which took form in the early decades of the 20th century. Where Darwin postulated natural selection as the main evolutionary mechanism, though not the only one, he was in the dark about the precise workings of heredity—which made many of his contemporaries doubt the viability of this model. We would call it Evolution 1.0 these days. But when the work of Gregor Mendel was (re)discovered around 1900, and the laws of heredity were formulated, Darwin was finally vindicated (let us call it Evolution 2.0).

This "modern synthesis," a term coined by Julian Huxley (1942) in his book *Evolution: The Modern Synthesis*, became the received evolutionary science. In recent decades, however, multiple *additional* evolutionary mechanisms have been proposed and debated, to the extent that an "extended" or "post-modern synthesis" has emerged (Evolution 3.0). Many of its insights have been documented in a single book as well: *Evolution: The Extended Synthesis* (2010) by Massimo Pigliucci and Gerd B. Müller. Table 2 provides a very rough timeline:

Table 2. Three generations of evolutionary thinking.

1850-1900	Charles Darwin	Evolution 1.0
1900-1950	The modern synthesis	Evolution 2.0
1950-2000	The extended synthesis	Evolution 3.0

Entire new fields of investigation have opened up this way, such as: evolutionary development or evo-devo, ecology, epigenetics and phenotypic plasticity (Pigliucci, 2007). And even then, some fields have been left out, according to Dutch biologist Gert Korthof (who owns a large online review website dealing with

this Third Evolutionary Synthesis, but also a great variety of critiques of Darwinism at www.wasdarwinwrong.com). He mentions among other things: endosymbiosis, horizontal gene transfer, viral evolution, earth system science, catastrophe theory, the origin of life and astrobiology (Korthof, 2014).

Difference of opinion exists in the field about how important these theoretical additions have been ("Extended Evolutionary Synthesis," n.d.). In my opinion this is just a testimony of the progress of science resulting in a richer image of the processes of evolution. At any rate, this is a lively field of scientific research. It is also sensitive to hype and exaggerated claims, as if Darwinism has been refuted. Just claiming, as Wilber does, that "the modern theory of evolution is catastrophically incomplete" is irresponsible without specifying what is included or excluded in the analysis. For sure, it is widely believed these days that the modern synthesis itself was still incomplete and needs to be expanded. Such is the progress of science.

In my opinion, this debate can be structured helpfully by seeing each of these schools of evolutionary thought as addressing one or more levels of the Linnean taxonomic hierarchy (Table 3).

Table 3. Evolutionary researchers address different taxonomic levels.

Taxonomic level	Researcher	Focus of study: Origin of...
Life	Kauffman	cells, molecules
Domains	Woese	bacteria, archaea, eukaryotes
Kingdoms	Margulis	fungi, animals, plants
Classes	Carroll	wings, eyes, limbs
Species	Darwin	species

In true integral fashion, this prevents researchers in the various fields to argue past each other. It is also relevant for assessing Wilber's statements on evolution, especially when he claims support from any of them.

As one well-known example of mixing taxonomic levels: where Darwin studied the origin of the various animal and plant *species*, Lynn Margulis (1998) focused on the way the animal and plant *kingdoms* emerged in the first place, through endosymbiosis of single celled organisms and bacteria, an insight she derived from early Russian biologists. In that sense, she went deeper, and further back in time, than Darwin was able to do. Margulis opposed Neo-Darwinist gradualism, not by invoking Spirit, but by empirically discovering *other evolutionary mechanisms*. Later in life she argued that endosymbiosis was also the main mechanism of speciation (Margulis & Sagan, 2002). But even if occasionally the tree of life shows signs of merging instead of splitting, especially in the case of horizontal gene transfer (Sapp, 2009; Quammen, 2018), the overwhelming majority of species emerge through splitting of populations (Coyne & Orr, 2004).

As a second example, and more relevant to my analysis, Stuart Kauffman pioneered the phenomena of self-organization, especially around the origin of cellular life and even molecular structure (Kauffman, 2019). His work is not addressing the question of speciation, which remains Darwin's domain, or symbiosis, which is Margulis's territory. Wilber often refers to Kauffman as an ally in his opposition to neo-darwinism. For example:

I am not alone is seeing that chance and natural selection by themselves are not enough to account for the emergence that we see in evolution. Stuart Kauffman and many others have criticized mere chance and natural selection as not adequate to account for this emergence (he sees the necessity of adding self-organization). (Wilber, 2007)

In doing so he overlooks that self-organization is not primarily the mechanism that produces biological adaptations or species; it is the process that spontaneously yields (constituent parts of) cells and molecules. We shouldn't mix taxonomic levels when discussing evolution. Nor should we prematurely take the incompleteness of neo-darwinism as proof for Spirit.

Then there are those scientists who stand closer to creationist or spiritual views of evolution, even though they still don't explicitly invoke divine influences. First there's the so-called “Third Way of Evolution” (at www.thethirdwayofevolution.com), which counts as members James A. Shapiro, Dennis Noble, Eva Jablonka, Gerd B. Müller, Eugene Koonin and many others. They argue that neo-Darwinism (or “ultra-Darwinism”) overlooks important aspects of the evolutionary process. They want to steer a mid-course between creationism and neo-Darwinism. Obviously, there is considerable overlap with the extended synthesis.

The creationists proper (or their pseudo-scientific spokespersons of intelligent design) argue more explicitly for a divine hand in nature. Michael Behe's *Darwin's Black Box* (1996)—a title Wilber has recommended to his students as evidence for the supposed failures of Darwinism (Wilber, 2005)—and further works inaugurated this movement, mostly in the US. Scientists have wholesale rejected this approach because it doesn't provide any *positive* evidence for or theory of divine intervention in evolution. It can only cast doubt on the capacity of naturalistic science to explain all of its details, usually by arguing for the “irreducible complexity” of this or that biochemical process. It is telling that Wilber sees intelligent design as an ally against the “flatland” approach of neo-darwinism, while overlooking the many *scientific* evolutionary schools critical of the modern synthesis.

I would like to highlight an aspect of the notion of design when it comes to biological complexity that is often overlooked. In the case of intelligent design, it is one thing to speculate about a cosmic Spirit which has designed biological organisms or biochemical processes, it is wholly something else to *implement* this design. It is unclear to all parties involved how this could possibly have worked. And this shortcoming applies to Wilber's Eros-theory as well. Even so, as late as Wilber's latest book *The Religion of Tomorrow* he has quoted creationist Hugh Ross (2001) to argue for the improbability of life, or a habitable planet Earth, without a divine Designer/Spirit/Eros (Wilber, 2017. p. 497-498). One may ask: what does Wilber have in mind here, that Eros/Spirit prepares a planet for us to live on?

Then again, it is sometimes suggested that a spiritual view of evolution becomes available only for highly developed researchers, who have entered post-formal stages of cognition of mystical states of consciousness. An unlikely hypothesis, as if all mystics would agree with Wilber's idiosyncratic view on evolution. And if they do not? Not enlightened enough? However, one could equally argue (playfully) that these post-modern developments in evolutionary science are already made possible by higher, post-formal forms of thought.

The first Darwinists stressed the element of competition, between separate and selfish individuals, most notably by using the term “the survival of the fittest” (a term that was coined by Herbert Spencer, not Darwin, and reluctantly used by the latter). Later theorists emphasized that cooperation is much more important (Kropotkin, Margulis, Sloan Wilson). This can be interpreted as a change from agency to communion. A truly “integral” view of evolution stresses the genealogy of all the various forms of life, first as a linear ladder but after Darwin more as a non-linear, bushy tree of life which branches out in all directions. All organisms are put in historical perspective by seeing them as descended from a last universal common ancestor (Dawkins, 2016). And to understand the recent findings of the prevalence of horizontal gene transfer even between different domains (i.e. viruses and humans) requires another mental transformation, crossing traditional boundaries between domains.

Ironically, at no point in this scheme of theoretical advancement have unspecified and unspecifiable spiritual factors been introduced. Even stronger, all these new discoveries have been made by modern empirical methods (microscopy, phylogenetics, etc.). Spiritual approaches have not contributed to our knowledge of evolution at all.

Wilber has covered very little of this evolutionary theoretical landscape in his writings, seemingly implying that one is either a neo-darwinist or a creationist. He seems to feel at home in the latter camp (Lane, 2011, 2017). Even if the field of evolutionary theory is a rich tapestry of schools and opinions, and debates often get considerably heated, most if not all scientists squarely

subscribe to the fundamental Darwinian notion that you can get to species without invoking Spirit in any of its guises.

Creationists, including Wilber, often seem to use the healthy controversy within this field of science as, or perhaps only as, an argument for the need to postulate Spirit. In defense of Wilber, some integralists (e.g., Reynolds, 2019) have claimed he is able to see the spiritual dimension of evolution because he uses his Eye of Spirit, whereas science is limited to the Eyes of mind and senses only, leading to a materialistic worldview. This raises the question: what additional insight into biological phenomena is gained by using such a form of extra-scientific knowledge? Reynolds argues that Eros or Spirit is not in any way a creationist God or Deity, but rather behind "everything that arises." This contradicts Wilber's many statements that evolution is "Spirit-in-action," in my opinion. But even if that were the case, its absence or presence wouldn't make any empirical difference. Like beauty, Eros seems to exist only in the eye of the beholder, but not in any objective, empirical sense. Does that make the notion of Eros theory or poetry? (Visser, 2017).

In summary, Wilber has rarely engaged the modern synthesis in a serious manner (and often ridiculed it), has not dealt with the extended synthesis and its many offshoots, has recommended his students to read Michael Behe, the front man of intelligent design, quotes creationists such as Hugh Ross, and at the same time claims to have "the only theory that can actually explain the mysteries of evolution" (Wilber, 2017, p. 14). To date, Wilber's sympathies and affinities do not appear to lie with the realm of evolutionary science.

HOW OR WHERE DO KEN WILBER AND EVOLUTIONARY SCIENCE MEET?

Given this situation, we should now ask, has Wilber contributed to our understanding of evolution, either by intelligently commenting on current scientific schools or debates of evolutionary thought or proposing a theoretically viable explanatory model of his own? Given the above analysis, the answer must be no, in both cases. Neither intelligent design nor Integral Design has been able to clarify how biological complexity has emerged under the influence of Spirit. This is and will remain a religious belief which is hard to reconcile with the

scientific method. This is Wilber's vision in a nutshell, as expressed in *Integral Spirituality*:

That drive—Eros by any other name—seems a perfectly realistic conclusion, given the facts of evolution as we know them. Let's just say there is plenty of room for a Kosmos of Eros. (Wilber, 2006a)

By repeating this catechism instead of substantiating it, Wilber is mixing up the factual language of science with the poetic language of religion, without attention to precise terminology ("by any other name"). Rather than offering positive evidence for the existence of Spirit, he is making an *inference*, in the same way that intelligent design uses this argument (Dembski, 2006), about the necessity for such a hypothesis.

Based on his writing thus far, it is difficult to discern the reach of Wilber's understanding of science. He often argues that science relates all phenomena to chance, and since chance by itself is obviously not able to produce biological complexity, "something other than chance" is needed. Here's a typical quote, taken from *A Brief History of Everything* (Wilber, 1996, p. 23):

In other words, something other than chance is pushing the universe. For traditional scientists, chance was their god. Chance would explain it all. Chance—plus unending time—would produce the universe. But they don't have unending time, and so their god fails them miserably. That god is dead. Chance is not what explains the universe; in fact, chance is what that universe is laboring mightily to overcome. Chance is exactly what the self-transcending drive of the Kosmos overcomes.

Science, however, sees chance as only one factor, lawfulness or necessity or selection being the other. Evolution is decidedly not the result of mere random chance, but also of non-random selection (Isaak, 2003).

Without any opportunity for a positive theory of evolution, explaining in detail how Spirit intervenes or how biological complexity is an expression of Spirit, the only alternative left for Wilber is point to developments in science which, if not prove his thesis, at least seem to go *in the right direction*. In this context he usually mentions two scientific giants: theoretical biologist Stuart Kauffman and complexity scientist and Nobel Prize winner Ilya Prigogine.

As stated before, Kauffman's field of research does not touch directly on the processes of speciation or adaptation. Regarding these fields Kauffman is a Darwinist (Kauffman, 2019, p. 87: “Darwin was right”). And since Wilber does not specify what this self-organization (understood by him as a spiritual phenomenon) is able to accomplish in terms of biological complexity (eyes?, wings?, cells?, multicellularity?)—in stark contrast to Kauffman's attention to detail—he can not present Kauffman as one of his allies. True, Kauffman (2008) has written *Reinventing the Sacred*, but that refers to an explicitly naturalistic sacredness or sacred naturalism. Contrary to Dawkins, he is not in favor of combatting religion, but instead wants to open our eyes to the wonders of nature itself. By elucidating empirical processes of self-organization, Kauffman may not be Wilber's ally at all, but in fact an adversary, given Wilber's explicitly spiritual agenda.

The same is true for Ilya Prigogine, who won a Nobel Prize for his work on dissipative structures, which are able to create “order-out-of-chaos.” Wilber (1995) reads into this phenomenon a transformative power of nature or even matter, which suits his spiritual philosophy. But in my opinion this interpretation is questionable. Self-organization definitely exists, and in many forms, but it is not something that can be explained or clarified by a single cause. What Prigogine actually discovered is that *under certain conditions* of energy flows, matter tends to assume a new structure, which processes (“dissipates”) this energy in a more efficient way. Order can thus be produced by *exporting disorder*. Likewise, we humans continuously have to take food in order to live and thrive and would otherwise die. A constant energy input is therefore needed to keep living organisms going. This pre-eminent role of energy flows or gradients is consistently overlooked by Wilber in his writings when discussing the emergence of complexity.

For example, in a recent video (Wilber & De Vos, 2019) he argues for a self-organizing drive *intrinsic* to matter:

That's why Prigogine, Nobel prize winner in 1967 or so... the research he did demonstrated absolutely beyond a shadow of doubt, that even dead and insentient matter, if you push it far from equilibrium, it will escape its turmoil by jumping to a higher level of self-organization. Matter does

that inherently! That is built in to it! You don't have to do something special, a funky thing to get it up and running.

> This strikes me as a misunderstanding of the nature of Prigogine's discoveries. Matter reorganizes itself under the impact of energy flows or laws such as gravity, not because it "inherently" wants to do that. Indeed, when the role of these energy flows through matter is made explicit—as is done much more adequately in the so-called Big History literature (Visser, 2013, 2014c)—there is no longer any need to invoke Spirit to explain complexity. Again, Prigogine might not be Wilber's ally here, but instead his opponent.
>
> This discussion relates to the wider field of entropy, which also is touched upon by Wilber in various recent online communications. Starting with the science story: The second law of thermodynamics holds that entropy—usually understood as disorder, but dispersion or diffusion is an alternative reading—tends to increase in nature, when no external energy is added to a system. Likewise, our Sun radiates energy in all directions, every single second of our lives, in huge amounts, lost forever in cold space. Only a tiny part of this energy output is captured by life on Earth to be used for the construction and maintenance of its cells. And interestingly, the more complex organisms are more efficient in capturing and dissipating this energy, either directly or indirectly. Thus, biological complexity emerges not against, but in accordance with this second law.
>
> Wilber (1995) has given a rather different reading of these scientific topics. In his understanding matter itself is able to "wind itself up," as he phrases it, which he even extrapolates to the universe at large. In *A Theory of Everything* (Wilber, 2000, p. x), he states:

The second law of thermodynamics tells us that in the real world, disorder always increases. Yet simple observation tells us that, in the real world, life creates order everywhere: the universe is winding up, not down. The revolutionary new understanding found in "chaos" and "complexity" theories maintains that the physical universe actually has an inherent tendency to create order...

> Note again the word "inherent" here. Wilber glosses over the scientific distinction between the second law, which works across the cosmos *globally*, and *local* pockets of complexification, which are possible given the right conditions

of energy flows. We clearly cannot just rely on "simple observation" in these matters. Simple observation tells us also that the sun rises… Wilber does not seem to go beyond this superficial analysis. But it is the Sun, not Eros, that in the end fuels the evolution of life on Earth in all its many forms.

In this quote, Wilber creates an artificial contrast between seeing the second law as pervasive, and the new findings of complexity science about the emergence of complexity, but that contrast is non-existent. Rather, it is a *paradox*, which is well understood by Big History authors, such as David Christian, but not by Wilber:

According to the second law of thermodynamics, the tendency of the Universe is for simplicity. There are no drivers for complexity… And since the universe tends to wind down, constant energy input is needed for complexity. (Christian, 2015)

How does the universe create complexity given the law of entropy?... with great difficulty. And with every next step, the going gets tougher… We, as complex creatures, desperately need to know this story of how the universe creates complexity, despite the second law." (Christian, 2011)

Again, Wilber's claim that some famous scientists support his position (without explicitly endorsing his spiritual view of things) is spurious. Much more reflection is needed here.

I would like to suggest the following metaphor to clarify the differences in worldview that are at stake here (Visser, 2018). Imagine we are paddling upstream on a river, that, naturally, flows downstream. Wilber concentrates upon our upward movement (i.e. psychological growth) and says: "we make an awful lot of progress on a river that is supposed to flow downstream!" By doing so, he overlooks the enormous amount of energy that is needed to make that happen (i.e. to sustain life). And he feels the curious need to cast doubt on the second law of thermodynamics ("the world is not winding down, it is winding up!"). Without grounding in basic science, he needs to invent his own cosmic dynamic of an Eros-in-the-Kosmos and an "Erotic Universe," as I have documented in an extra online chapter of *Ken Wilber: Thought as Passion* (Visser, 2014b). Wilber wants to have his rivers run upstream.

CONCLUSION

Overseeing the questionable strategies Wilber has followed to argue for his Spirit-driven "theory" of evolution, in contrast to science, I see these three as most problematic.

1. **Claiming failures of science**—Wilber has been skeptical about science's capacity to explain certain forms of biological complexity (similar to arguments provided by intelligent design). Examples he has used are: the evolution of eyes and wings, the human immune system, multi-cellularity, morphogenesis, regeneration, etc. In none of these areas has he reported on current scientific research. He has also not been explicit in where he draws the line between what science cannot explain and what it can.
2. **Claiming support from science**—Wilber has suggested similarity between his ideas and those of famous scientists, without adequately accounting for major differences, even though he has at the same time acknowledged that mainstream scientists do not support his spiritual view of evolution. When we look beyond verbal similarities such as "the universe is creative" and search for actual explanatory mechanisms, the fundamental differences between Wilber and these authors does not result in support from science.
3. **Claiming superiority to science**—Wilber has continuously proclaimed the superiority of his own "theory" of evolution without meeting the demands of theory formation in science. What he has to offer is in fact not evolutionary theory but evolutionary theology. A true theory clarifies natural processes and breaks them down into explicit steps, by suggesting possible mechanisms. Wilber's "Eros-theory" is by definition and in principle not able to do just that.

In baseball, the rule is "with three strikes you are out." I do think that when it comes to Wilber's dealings with these fields of science, given these failed strategies, the game is over.

When responding (briefly and unsystematically) to my challenges, he (Wilber & De Vos, 2018) once called me an "extremely conventional evolutionary theorist" (I have actually

> no idea what he means by this: does it refer to Evolution 1.0, Evolution 2.0, Evolution 3.0?).

I am always getting criticized by extremely conventional evolutionary theorists, like Frank Visser, because I postulate Eros, an inherent novelty in the cosmos... which by the way is Whiteheads point, the 'creative advance into novelty'. Eros... Stuart Kauffman, self-organization is built into the universe. Eros... Ilya Prigogine, a Nobel prize winner. 'Order out of chaos'. Even insentient matter, when pushed far from equilibrium, jumps into higher levels of order. Eros...

> But name-dropping and sloganeering is not the same as doing responsible science or philosophy. In Wilber's universe one is either a flatland scientist in favor of neo-darwinist, flatland reductionism, or a spiritual theorist who sees the Divine as active everywhere in nature. As I have argued, there is a huge middle ground that is covered by contemporary evolutionary science, which is worthy of further careful exploration. Instead of repeatedly claiming “support” from a handful of famous theorists, who are either long dead or have not been in contact with Wilber, it is more honest to acknowledge the theoretical vacuity and lack of sophistication of the whole notion of “evolution as Spirit-in-Action.” A more robust integration of evolutionary theory within Integral Theory is called for.
>
> Finally, some humility is in order when it comes to making far-reaching knowledge claims. Science, and especially evolutionary science, is such a wonderful field of human endeavor, that it does not deserve to be maltreated by “the world's greatest philosopher.” Evolutionary theory is a rich and varied landscape that cannot be dealt with in a few sketchy paragraphs. Furthermore, shouldn't the integral movement open up its windows by now to theoretical approaches outside of its own ideological domain? The absence of a healthy culture of debate, the strongly emotional reactions of Wilber to theoretical challenges over the years and the intellectual apathy of the integral community around matters of science do not help us in our search for assessing the truth and validity of Wilber's particular views on evolution.

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