

## Intuitions for the simplest model in which the evolution of the laws of nature arises from the natural selection of structures [closed]

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The problem I'm trying to solve can be described as

**To create the simplest model possible in which the evolution of the laws of nature arises from the natural selection of structures.**

This approach implies indeterminism and postulates random and spontaneous nature of some events. It is also assumed that the universe had the beginning (the first moment of existence). This task is meant to provide the tychism doctrine by Charles Peirce with a mathematically accurate dynamic model.

The mathematical model is intended to describe the process of changing of a discrete structure (like graph, consisting of interconnected atomic parts). Moreover, it should be the process of development and complication of the structure.

### 1) The model as the process of natural selection

The postulates of natural selection:

- (p1) Individuals and the environment (individuals are the environment?)
- (p2) Natural selection
- (p3) Reproduction (doubling?)
- (p4) Heredity (conservation/invariability?)
- (p5) Variation (spontaneous/random?)

During natural selection the information about the environment “imprints” into the structure of individuals.

Presumably the environment will be other individuals, and there would be nothing but individuals. It may even be very primitive “atomic” individuals (whatever that means).

For natural selection to work, individual and its descendants must meet very similar events and interactions. “Reproduction” (p3) provides an environment of identical individuals. But apart from similar events they meet new and unique ones, which are provided by “variation” (p5).

### 2) The model as the structure that changes in time

It can be assumed that individuals are stable patterns like waves existing in the discrete structure. Their origin may even be the topological curvature (knots? braids?). The patterns should be resistant to perturbations. Presumably perturbations arise from reproduction and variation postulates of natural selection.

The process starts from a very simple state of the structure. It may be something like “nothing”, the empty set, “unity” or “one”. But the state of minimum complexity from which the process begins is still under consideration.

The rules or meta-rules of changing this simple state must be initially defined.

Presumably, the rules at the same time give rise to the structure that consist of interconnected atomic parts, and produce the natural selection of patterns in the structure.

The structure is discrete and finite. Steps of time that correspond to changes in the structure, are also discrete.

**So the two views on the model to create:**

1. The model as the process of natural selection
2. The model as the structure that changes in time.

**The subproblem I'm trying to solve at the moment is the following:**

1) How is it that the pattern in the structure is the same as the individual in the natural selection? So it's necessary to combine two views on the process and create a complete and holistic picture. And the pattern and the individual are the same in that picture.

2) What are the “atoms” in this structure? What's the basis of this picture? May be the atomic parts in the structure similar to a graph are the atomic individuals. And these atomic individuals easily increase their number. Then how do non-atomic individuals appear?

So my question is a request for intuitions on how to create that complete picture that satisfies the constraints.

More details on this research problem are described in this article: [http://zagubisalo.tumblr.com/open\\_letter](http://zagubisalo.tumblr.com/open_letter)

**PS**

My main goal briefly and correctly: to create a model of Open Ended Evolution (Then test it on the PC. May be even with hardware random number generator). I've recently found this team <http://www.tim-taylor.com/oe1/> They use that name for artificial life that don't stop it's evolution on a fixed level of complexity but instead progresses further. The only difference seem to be that the model I'd like to create is planned to be the simplest model. To be the simplest in the philosophical sence. Like Occam's razor. These restrictions of simplicity make the difficulties that I was describing in this question and the open letter (start from the simplest structure, no predetermined structures except natural selection postulates, no environment, only individuals).

And the final goal is to answer the "why these laws of nature?" question. More precisely: why these processes take place but not the other. The history in the model of natural selection is a perfect explanation (if we know the whole history) and answer to any "why?" question. But for the model of open ended evolution to be a candidate for a model of the beginning of the universe it should be the simplest model possible (from the philosophical reasoning).

The next question on the topic: On the task to create the minimum mathematical model for open ended evolution  
<https://math.stackexchange.com/questions/1613087/>

- cosmology
- waves
- universe
- mathematics

edited Apr 13 '17 at 12:19



Community ♦  
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asked Jan 14 '16 at 11:04



Peter Zagubisalo  
11 2

**closed** as unclear what you're asking by [Carl Witthoft](#), [ACuriousMind ♦](#), [John Rennie](#), [CuriousOne](#), [Gert](#) Jan 14 '16 at 17:42

Please clarify your specific problem or add additional details to highlight exactly what you need. As it's currently written, it's hard to tell exactly what you're asking. See the [How to Ask](#) page for help clarifying this question.

If this question can be reworted to fit the rules in the [help center](#), please [edit your question](#).

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Apart from various other concerns one comment: Evolution comes with an increase in complexity, whereas the physical laws evolve from (possibly) a complex unified theory at large energies etc. to arguably simpler effective theories (particles, distinct forces) – [Bort](#) Jan 14 '16 at 11:14
- @Bort

Yes, you got the main difference right. Apart from that, effective theories describe a smaller part of the reality than the unified theories. So there is no surprise that they are simpler. The assumption of the simpler state in the past and evolution that creates complexity is the attempt to answer the "Why these laws question". I cannot foresee any other ways of answering it. – [Peter Zagubisalo](#) Jan 14 '16 at 11:36
- @Bort

And also this question fits well with Lee Smolin assumption of cosmological natural selection. – [Peter Zagubisalo](#) Jan 14 '16 at 11:38
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▢

This is philosophical wanking. – [Carl Witthoft](#) Jan 14 '16 at 12:40
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Maybe you want to read the definition of science a couple more times? – [CuriousOne](#) Jan 14 '16 at 16:31

@CuriousOne

I know it quite well. This research task satisfies only two of three main scientific criteria: Occam's razor and Coherentism (different scientific theories support each other and make the whole picture without contradictions). But fails falsification criteria. At least now. – [Peter Zagubisalo](#) Jan 14 '16 at 17:12

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added PS section // – [Peter Zagubisalo](#) Jan 14 '16 at 17:13

▢

No, that's not the scientific method, but OK... if you think that it is. – [CuriousOne](#) Jan 14 '16 at 17:16

@Bort

Thank you for the comment. It's a good question about the viability of the research problem. – [Peter Zagubisalo](#) Jan 27 '16 at 8:00