Review of: "Evolution, Through the Lens of a Physicist"

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It is a beautifully written manuscript in which a biologist, specifically a molecular biologist, gets trapped and wonders whether he/she should rethink many of our “dogmas”. Thinking has a profound meaning nowadays because we are always in a hurry to read novel findings and find out how we may use them. A plant geneticist friend used to consider us, molecular microbiologists, as impatient ‘nasty’ people who could not wait until the next morning when the results must be, waiting for us, on our bench. However, over the years, we have learnt not only patience but also a fundamental truth in biology (as in other sciences, I assume): either we finally know the mechanism of how a biological system functions or we are left with a more or less exciting description of the experimental observations.

All of this is to say that I enjoyed reading Driesse’s manuscript and feel honoured to be able to make a few minor comments:

1. The concepts of chance and necessity (purpose) were developed by Jacques Monod in "Chance and Necessity: Essay on the Natural Philosophy of Modern Biology". It is an essay on the natural philosophy of modern biology (1970), a reference that should be provided and, perhaps, discussed in the following paragraphs. The essay is, of course, outdated, but worth reading and mentioning.

2. On the matter of chance or intention, it is worth pointing to the anthropogenic intervention in evolution. Humans, especially after the Anthropogenic Age (let’s say, the Industrial Revolution), have developed a fever for increasing productivity and, as such, have introduced in Nature several factors that have resulted in an accelerated evolution. The employment of pesticides, herbicides, fungicides, and antibiotics at a large scale has put a huge selective pressure on the “victims” that has led to the selection of extremely resistant organisms, carrying unforeseen mutations. I know that these facts may not pertain to the present article, but it could be worth considering.

3. On the reductionism in biology, one cannot but agree with the author. However, the idea that “…In investigating living matter, one may find organs built of cells with the DNA helix” is reductionist per se: we have to consider the epigenetics of the organisms and how “simple” mechanisms such as the methylation of one of the helices result in different phenotypic effects.