

Essay 1 - Introduction to Astrobiology

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Evolution of Life on Earth

It's very interesting to think about the way they claimed life slowly evolved on Earth. The thought that these simple molecules in "chemical soup" could evolve into these worms and then evolve into worms with memory and then evolve into other creatures like humans is fascinating. It definitely makes you think about the possibilities of life on other planets. Surely, if life could evolve from just chemicals here, then what is the possibility of it happening on other planets?

Life as a lego set

This whole idea of assembly theory makes you think about how much of a miracle it is that life even happened on Earth. They use this metaphor of a lego set in the podcast to describe how the creation of life is like putting together a lego set. If you wanted to create the hogwarts castle, it would be nearly impossible to do it by simply shaking the table that the legos are on and hoping that they would assemble into the castle. Having the right pieces in the right place is crucial to the assembly of the castle. This is the same with life. I believe they also use this same theory to describe how important it is that we have genetic code telling us how to assemble the proteins in our body. Without this code, it would be impossible for life to replicate and evolve. It would be like assembling the hogwarts castle without the instructions.

John von Neumann's Self Replicating Machines

They went on to describe how early computational models like the Turin machine and John von Neumann's self replicating machines were the first steps in understanding how life could replicate. It's very interesting to think about how closely related life is to these machines. It's even more interesting to think about how it relates to the idea of life on other planets. If life elsewhere is also based on the same linear instruction set, then it could serve as a framework for studying life across the universe.

Conservation

This entire concept of conservation in biology, is a testament to the shared foundations in which life is built upon across different organisms. The way that different organisms have come to be is shown to be an inevitable result of any complex evolving system. They gave this metaphor of evolution being like a bowling alley with bumpers. The bumpers are the conservation laws that keep the ball from going into the gutter. It just goes to show that life and really anything in a complex system is bound to follow certain rules. These same rules are universal and can be applied to other areas like the job market as well.

Assembly Theory

It's interesting how they delve into this idea that each molecule in the universe can be given a certain "assembly index". This is a value that indicates the probability that a given molecule will be able to assemble into life. The analogy of creating a new type of cookie highlights the importance of having an open mind when it comes to searching for life. We must think beyond our own reality and consider the possibility that things might not always follow the same theories that we have come to know because of the observations we have made on Earth.

Conclusion

Overall, I found this podcast to be very interesting. It makes me excited to think about the possibilities of life on other planets, and how we might be able to find it. It's a very exciting time to be alive and I can't wait to see what the future holds for astrobiology.