

Biogenesis – All Life comes from Life – Tim Bolland

Introduction

The failure of scientists (after numerous attempts) to define Life in a way that draws a clear and meaningful distinction between living things and non-living things, suggests that either:

1. The distinction between Life and non-Life is entirely arbitrary – it is whatever we choose it to be – and hence there is no correct answer to the question *What is Life?*; or
2. There is a correct answer to the question *What is Life?*, one that draws a clear and meaningful distinction between Life and non-Life, we just haven't figured it out yet.

To believe the first of these is to suggest that Life is nothing more than a concept in our minds, i.e. it doesn't exist as a category of things in the real world and therefore may be eliminated from our descriptions of that world, losing nothing in the process. To think this way is to adopt the attitude that certain physicalists adopt with regard to mental states such as qualia. My intuition tells me that this eliminativist attitude towards Life is wrong. I favour the second possibility above: that Life does really exist; that we can draw a clear and meaningful distinction between Life and non-Life; and hence there is a correct answer to the question. The fact that we haven't found that answer yet suggests there is something about Life we do not yet understand. My aim is to find that something, develop a definition that works, and thus answer, once and for all, the question *What is Life?*

I will do this by considering two natural events that are unique to living things – Birth and Death. I shall begin with Death.

Death

One might reasonably answer the question *What is Life?* by saying "Life is the ability to die". Death is a natural part of Life and something we only see with living things. Non-living things, such as chairs or robots, may break, but can easily be fixed. Bringing the dead back to life is not so easy.

On closer inspection, this distinction is not that straightforward. Non-living things decay over time, as do living things that have died. The only difference is that the former tend to decay over a long period of time, while the latter do so more rapidly. Indeed, it is the speed of that decay which highlights what is most remarkable about living things – their ability to fight against the natural forces that would cause the decay of their bodies, for that period during which they are alive. This fight for survival, against enemies large and small, is the first key characteristic of Life I want to highlight. We might suggest that:

*Life is the activity of a living thing to maintain its material existence,
despite its hostile environment.*

This hostile environment applies also to non-living things, which is why they decay over time too. They can be maintained, of course, so as to counter that decay and remain in existence for longer than they would otherwise. However, they require a living thing, such as a human being, to do this. What's remarkable about living things is that they actively maintain themselves.

This definition is good, but not quite good enough. As with so many others, we can find counter-examples. We could build a robot, for example, which acts to replenish its energy sources, enabling it to gather the materials it needs to maintain its material existence. Does this mean that the robot is alive? No, I don't believe it does. There is clearly a difference between self-maintaining robots and natural living things, one that makes us not want to classify the robot as Life. So, let's now take a look at that other natural event in a living thing's life and see what it can add to the picture.

Birth

Question: What came first, the chicken or the egg?

- If you answer "chicken", I might ask: "Where did the chicken come from?"
- If you answer "egg", I might ask: "Where did the egg come from?"

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This riddle is based on the notion of *biogenesis* – that all Life comes from Life – a principle articulated by biologist Thomas Huxley in 1870¹:

*Living matter always arises by the agency
of pre-existing living matter*

Huxley also coined the term *abiogenesis* to mean the opposite view, that Life can emerge from non-living matter, something he believed was not possible. Today, of course, no serious scientist believes in biogenesis, since clearly there had to be a first ever living thing, otherwise Life could not have begun. Abiogenesis must have happened at least once, whether that was in the primordial soup of early planet earth, or elsewhere in the universe and brought to earth, perhaps on a comet. And yet, we have no actual evidence for abiogenesis occurring. We can, in contrast, confidently say that 99.9999(*put as many 9s here as you wish*)% of living things that have ever existed on planet earth (with perhaps that one exception of the first ever living thing) came into existence through the agency and material of pre-existing living things. I find that fact significant.

It is clear that both living and non-living things may be created by living things, but there is a difference in how this is achieved. We create non-living things from one or more parts, which we cut, mould, or otherwise shape from the material available to us. We do not create living things this way. All we do is provide a nice warm environment for two existing living things (an egg and a sperm) to create a new living thing (a zygote, or fertilised egg), using the material of their own bodies. What's more, since the egg and the sperm together are numerically identical to the zygote in that moment of conception, one might almost say that the new living thing created itself! This allows us to update our definition of Life as follows:

***Life is the activity of a living thing to create its material existence from other living things
and maintain that existence, despite its hostile environment.***

From what I can tell, this definition provides the clear and meaningful distinction that we've been looking for: all things that we typically consider non-living (including self-maintaining robots and computer viruses) do not meet this definition; while all those things that we typically call living do. It does mean that communities of living things, such as companies and nations, would be counted as examples of Life, since they too meet this definition. Although, that might not be a bad thing...

You see, if this definition of Life is correct, then biogenesis is true, there never was a first ever living thing and Life has existed for all time - all the way back to the Big Bang. This suggests that molecules, atoms, particles, etc. are all living things; that, in the same way that human beings are communities of living cells, cells are communities of living organelles, organelles are communities of living molecules, molecules are communities of living atoms, etc. etc. etc. In other words:

Every living thing is a community of other living things

This is the Universal Life Hypothesis, a statement which (if true) means that matter is not made from simple, non-living particles, as physicists have assumed; it is made from complex living things, which are themselves made from complex living things, and so on, and so on, *ad infinitum*. This is the scientific worldview I call Universal Life. It not only provides a more accurate understanding of matter and of Life, it explains why physicists can't find their fundamental Laws of Nature and allows us to solve several major problems that cannot be solved within our current scientific worldview. These include the Hard Problem of Consciousness, Free-will and Determinism, the Fine-tuning Problem and the challenge of interpreting Quantum Mechanics. For an introduction to the Theory of Universal Life, please see my recently-released book, ***Life, the Universe and Consciousness***².

References:

1. Huxley, Thomas (1870), *Biogenesis and Abiogenesis*, Huxley's Collected Essays, Vol. VIII.
2. Bollands, A. T. (2020), *An introduction to the Theory of Universal Life and the solution to twelve intractable problems of Life, the Universe and Consciousness*, available on Amazon.