

Hand of God

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I. INTRODUCTION

There are many things for which we don't have any explanation. Many of them are not even rational. But they have happened or are happening. We use the words like random, chance or fate for them. Are these happenings teleological? That means, for a purpose, that we do not know. This paper discusses some of such happenings in nature.

II. THE BIG BANG

Astronomers have gathered enough data in the last about a few decades to put forward a theory about the origin of universe. In his book *The First Three Minutes*, Steven Weinberg, winner of 1979 Nobel Prize for physics writes that it all started with an explosion. The explosion created matter and space. There was no need for space, in the absence of matter. The space, itself was defined by the matter contained in it.

From where did the energy come? Why did it convert into matter? Why at that time? What was 'time' before this time? What was in the space before it was occupied by the space as we know it today?

Weinberg says that energy converted into particles of electrons, positrons and photons, followed by neutrons and protons. The theory explains the formation of nuclei of atoms, as we know them today. Within the first three minutes, the universe contained the nuclear material of hydrogen, helium, electrons and photons. It took millions of years before atoms of hydrogen and helium were formed. These gases formed clumps due to gravity and later became galaxies.

The theory of Big Bang has been supported by some evidence. It will be fine-tuned with advancements in the fields of subatomic physics and astronomy.

Why did the energy convert into electrons, protons and neutrons, which make the foundation of all the material world that we know? Were there other options? Many of the details mentioned above, were not known earlier; say about 50 years ago. Even now these are a hypothesis which is subject to corrections.

III. BEGINNING OF LIFE

It is believed that earth was formed about 4.6 billion years ago and that early life started about 3.4 billion years ago. Most chemists believe that life started from mixtures of molecules in the prebiotic earth. Why and how should inert matter become 'life'? Nature moves towards equilibrium and

low energy states. Life is complex, high energy and far from equilibrium!

Building blocks of life are cells. A simple cell has no brain or neural activity. It is a chemical aggregate in a membrane, which is also chemical. Its agenda is to seek food, avoid danger and live. A cell is like a nano-factory, with components at molecular level, one millionth of a millimeter. It extracts energy from environment, stores it in chemical forms to build, control and regulate the cellular machinery. It is very complex and maintains itself by utilizing energy.

Life is defined as a material system that can acquire, store, process and use information to organize its activities. NASA defined life as a self-sustained chemical system capable of undergoing Darwinian evolution.

Addy Pross, in his book *What is Life*, attempts to provide some answers. Within biological systems, catalysts (enzymes) play an important role. In the reactions, where the products are the catalysts, the rate increases exponentially. Pross explains that RNA is ribonucleic acid and is very slightly different from DNA. In an experiment, RNA strand was mixed with its free floating building blocks and an enzyme. The RNA strand made copies of itself. RNA molecule is a chain of segments called nucleotides building blocks. These building blocks, in the chain, make their complementary copies from those in the mixture which in turn makes more RNA copies. Discovery of self-replicating molecules can explain the beginning of life.

Population of replicating RNA molecules can evolve. Over time the long chain molecules become shorter ones which are more efficient at replicating. The latter can cause extinction of the former. This is natural selection in chemical world.

In another experiment, scientists took a mixture of prebiotic components hydrogen, ammonia, methane and water vapor and passed an electric discharge. Many organic matters were formed including amino acids which are building blocks of proteins which in turn are key components of all living systems.

In regular chemistry, matter is stable if it does not react. In replicating chemistry, stability comes from reactivity: more it replicates more it is stable. The slower replicators react to become efficient. A working definition of life: a self-sustaining, kinetically stable dynamic reaction network, derived from the replication reaction.

According to Pross, synthesizing life is a matter of organization and not of materials. It is like juggling 5 balls; the phenomenon consists of organizing the process and not 5 balls and a juggler.

In simple words, the ingredients of all forms of life are known or knowable. The question is: what makes it 'alive'? Even the simplest form of life has not yet been created artificially. Pross' s example of the juggler is interesting. The juggler is the part of the phenomenon of juggling. Only he can start the phenomenon. An outsider cannot induce the process. Moreover juggling cannot be learnt by learning the laws of gravity and the weights of the balls.

Even if the theory of replication reactions is true; knowing the chemical laws is not the same as understanding life.

IV. CONCEPTION OF NEW LIFE

Conception of a human being; a single cell transforming into a complete human being, is incredible. One's individual genetic identity is sealed at the time of one of father's sperm swimming into mother's egg. Alice Roberts, in her book *The Incredible Unlikelihood of Being* explains the happenings in detail.

At the moment of contact, the membranes of the sperm and egg fuse:

- The sperm continues to swim into the egg, leaving its membrane behind.
- Inside the egg, there are tiny bags of chemicals which release their contents to harden the inside of the egg membrane. This prevents any other sperm reaching into the egg.
- The maternal DNA prepares for its chromosomes to pair up with the male set.

As the sperm enters into the egg, its tail, which brought it to the egg, falls away. The package of chromosomes is located in the head of the sperm. It is this package that the egg needs. The genetic material swells as the chromosomes are unpacked.

The double strand of DNA, which forms each chromosome, is unzipped. Two new zips are formed. Same thing happens with the chromosomes of the egg. These two sets, each of two sets of chromosomes, push together and fuse.

There are now 46 pairs of chromosomes, which are enough DNA for two cells. The two, newly formed pairs, pull apart from each other. In this process the membrane of the cell becomes dumbbell shaped and then splits. This is how the first two cells are born. Towards the end of the first day of life, a human being is just two cells. These cells divide again and again. After three days of life, there are 16 cells.

The inner cells form the embryo whereas the outer ones help forming the placenta. After the fourth week the human embryo resembles a fish embryo, at a similar stage of development. Later it looks like the embryos of a chick, a turtle, a pig, a cow, a dog and finally human. This shows the real links between ancestors and descendants.

The two sets of double-helix, containing all the DNA information from the male and female, break away from the original to form two new identical double-helices. These two contain the genetic identity of the newly conceived human being. Some are born talented, others ordinary and some physically or mentally challenged.

V. THE HAND OF GOD

Man has been wondering about the mysteries of nature. Possibly these mysteries created the need for God; someone who does things as He wishes. Therefore anything man could not explain was attributed to Him. Phenomena like rain, thunder, day, night were caused at His wish.

God was the only answer to the creation of the universe, origin of species and varied human nature.

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