1 **The Origin of Life**

- Module: Science
- Lesson 26

2 **Some Recommended Sources**

- Unlocking The Mystery of Life, DVD produced by Illustra Media, also available online at https://www.youtube.com/watch?v=tzj8iXiVDT8&t=3028s
- The Mystery of Life's Origin, The Continuing Controversy, by Charles Thaxton, et. al. (Newly released [2020] expanded version of the 1984 seminal work The Mystery of Life, Reassessing Current Theories, by Thaxton, Bradley, & Olsen.)
- James Tour on the Origin of LIfe, video (1 hr. 30 min including Q & A): https://www.youtube.com/watch?v=-Gsa58Rm8Sk&t=1912s
- James Tour, paper: "Animadversions of a Synthetic Chemist," at: https://inference-review.com/article/animadversions-of-a-synthetic-chemist
- The Design Revolution, by William Dembski
- Theistic Evolution: a Scientific, Philosophical, and Theological Critique, ed. by Moreland, Myer, Shaw, Gauger, and Grudem. (esp. chpt. 4)

3 **A Biblical Perspective On Life's Origin**

- By faith we understand God created all things, including life.
  - "By faith we understand that the worlds were prepared by the word of God, so that what is seen was not made out of things which are visible." (Hebrews 11:3)
  - "All things came into being through Him, and apart from Him nothing came into being that has come into being." (John 1:3)
- Biological life was brought into existence by God.
  - "Then God said, "Let the earth sprout vegetation, plants yielding seed, and fruit trees on the earth bearing fruit after their kind with seed in them"; and it was so." (1:11)
  - "Then God said, 'Let the waters teem with swarms of living creatures, and let birds fly above the earth in the open expanse of the heavens.' God created the great sea monsters and every living creature that moves, with which the waters swarmed and their kind, and every winged bird after its kind." (1:20, 21)
  - "Then the Lord God formed man of the dust from the ground, and breathed into his nostrils the breath of life; and man became a living being." (2:7)

4 **A Biblical Perspective On Life's Origin**

- A primary feature of biological life is self-replication.
  - "...plants yielding seed, and fruit trees on the earth bearing fruit after their kind with seed in them" (Gen. 1:11)

- "God blessed them, saying, 'Be fruitful and multiply, and fill the waters in the seas, and let birds multiply on the earth.'" (Gen.1:22)
- "God blessed them (man and woman); and God said to them, 'Be fruitful and multiply, and fill the earth…'" (Gen. 1:28)

- Self-replication of biologically living creatures was "after its kind".
  - "…plants yielding seed, and fruit trees on the earth bearing fruit after their kind with seed in them" (Gen. 1:11)
  - "Then God said, "Let the earth bring forth living creatures after their kind: cattle and creeping things and beasts of the earth after their kind"; and it was so." (Gen. 1:24, also 1:12, 21, 25)

5 Naturalism's Challenge: The Origin of Life

- Abiogenesis [a, without; bio, life; genesis, beginning]: The generation of life on the prebiotic earth from non-living matter by natural means.
- Darwinism, the reigning paradigm of naturalism, only addresses what happens after life begins.
  - An essential mechanism of Darwinian evolution is natural selection. However, natural selection can only operate on self-replicating living organisms (i.e. entities that are able to mutate during replication).
  - Hence, something must be alive before Darwinian processes are able to operate.
- Any attempt to explain the origin of life in the pre-biotic world by a Darwinian mechanism would appear, logically, to be a non-starter.
- Nevertheless, scientists for a century have been attempting to account for life's origin either by random chance interactions of natural elements, or through some quasi natural selection, or a combination of the two.

6 Two Materialist Approaches to the Abiogenesis Question

- For decades many scientists sought to account for life arising from strictly non-living matter by random chance. (Somewhat like mutations in evolution.)
  - 1966 Wistar Institute symposium on evolution revealed computer mathematical models showing that "the complexity of the biological world could not have originated by chance even within a time span of ten billion years." (Thaxton, et. al. the Mystery of Life's Origin, 2020)
  - Later calculations based on the laws of thermodynamics have corroborated earlier calculations, regardless of what particular process of abiogenesis one imagines.
  - Recent calculations by Dembski and Axe demonstrate:
    - Granting, for the sake of argument, scientists' belief in 13.8 billion years for the age of the cosmos, there have been roughly 10139 possible elementary particle events in the history of the observable cosmos. (Dembski)
    - For just one moderately sized protein, 150 amino acids in length, there are 10164 possible non-functional arrangements of those same amino acids.

- The odds against achieving by chance just one functional arrangement of amino acids (1 in 10164) “vastly exceeds the probabilistic resources of the universe” (10139 events). (Meyer in The Mystery of the Origin of Life, p. 435)

7 Two Materialist Approaches to the Abiogenesis Question

- As the overwhelming probability odds against a chance occurrence became clear, emphasis has shifted towards finding some kind of “natural selection” or “biochemical predestination” (necessity) process whereby life could have arisen. (Or a combination of necessity and chance.)

8 Hurdles to a Materialist Origin of Life

- Fine Tuning: How can one account for the infinitely precise fine-tuning of the universe and our planet to be able to accommodate living organisms?
- Abiogenesis: How did living organisms arise from exclusively non-living mater (chemicals)?
- Proteins or DNA: Which came first, the chicken or the egg?
- Information: From where did the vast encyclopedia of information in the DNA and beyond DNA come?
- Assembly: How does the “machinery” of the cell know where to assemble each of the vast array of proteins once they are “manufactured?”

9 Some Definitions to Know

- DNA (deoxyribonucleic acid) is a macromolecule in a ladder-like double helix structure. Each “rung” of the ladder is made up of two nucleotide bases. Each nucleotide is one of four possible, designated “A”, “C”, “G”, and “T” (adenine, guanine, cytosine, thymine) The precise arrangement of the nucleotides constitutes the genetic code which provides much of the information which makes a living organism what it is. There are approximately 3.2 billion base pairs (“rungs”) in the human DNA molecule.
- Genes are sections of DNA, some of which contain the information for constructing one or more proteins. There are approximately 20,000 genes in the human DNA. Multi-coding genes can form many different proteins, resulting in several hundred thousand different proteins.
- RNA is a string of nucleotides that are copied from the genes in the DNA. Messenger RNAs convey the information from the DNA to a “machine” called a ribosome for the construction of various proteins using amino acids. (RNA bases are “A”, “C”, “G” and “U” [uracil].)

10 **Some Definitions to Know**

- Amino Acids are the molecules that constitute the structure of proteins. Long chains made up from twenty different amino acids are assembled in a precise order according to information from the DNA, then "fold" in on each other in specific ways to form the thousands of differently shaped proteins needed by the organism.
- Proteins are the building blocks of the cell and the "machines" in the cell, they do most of the work of the cell, and are required for the structure, function, and regulation of the organism's tissues and organs. There are hundreds of thousands of different proteins, with distinct shapes according to their intended purpose.

11 **1. Fine Tuning: Why Can Life on Earth Exist?**

- The Anthropic Principle: The universe and our earth are seemingly impossibly finely tuned to permit the existence of life.
- "Fine Tuning" refers to the precise nature of the values of the constants and quantities in question that are necessary to permit the existence of life. There are literally dozens of such values in our universe, every one of which must be narrowly "set" within a precise parameter or else life could not exist.
- Given the narrow window of these cumulative values, and given chance alone, it is astronomically more probable that life would not be able to exist than that it would be.

12 **Naturalism and the Anthropic Principle**

- (We have discussed the anthropic principle in our earlier lesson on the teleological argument for God's existence. Lesson 10)
- Some naturalists argue:
  - It is not surprising that we find the universe compatible with living organisms, because we obviously exist.
  - Since it is not surprising that we find such a universe, there is no need to find an explanation for the fine tuning.

13 **Naturalism and the Anthropic Principle**

- Such an argument confuses the issue:
  - It is true, that if living observers exist in the universe, they must, obviously, observe a universe that is finely tuned for their existence.

- It is false, however, given all the vast number of possible ways our universe could be life-prohibiting, that it is highly probable that by chance alone the universe would be finely tuned to permit us to exist.
- The question is not why do we observe a life-permitting universe, but why, given the astronomical odds against it, does a life-permitting universe exist?

14 **2. Abiogenesis: How to Explain the Origin of Life From Non-living Matter**

- The Primordial Soup
- Alexander Oparin (Russian scientist, 1920s) proposed a particular composition of the early earth's atmosphere, into which the introduction of energy (ultraviolet light, lightning, etc.) would have produced amino acids, necessary for the building of proteins and, subsequently, life.
- Stanley Miller conducted an experiment (the "Miller-Urey" experiment,1952), subsequently reproduced and modified by many others, in which he employed Oparin's suggested atmospheric composition, and by introducing electricity he produced some amino acids, one of the building blocks of life.
- Many people mistakenly believe that Miller (and subsequently many others) have produced life by this means, or at least demonstrated how life could have been spontaneously created in the early primordial soup.

15 **Attempts to Explain the Origin of Life**

- The Failure of the Primordial Soup Explanation
- Geological data now shows no evidence that a prebiotic "soup," such as Oparin, Miller, and many others imagined, ever existed on the early earth.
- The atmosphere of the early earth is now believed to have consisted of chemicals that would have been inimical to the development or preservation of amino acids. (Rather than being a strongly reducing atmosphere, necessary for the chemical reactions required for abiogenesis, it is now believed the early earth's atmosphere was only mildly reducing or possibly even an oxidizing atmosphere.)
- Allowing for a prebiotic "soup" and atmosphere as once imagined, Miller's experiment, and others like it, do produce amino acids, but that is a far cry from actually producing a protein, much less producing life.

16 **Attempts to Explain the Origin of Life**

- Chemical Evolution
- Abandoning the effort to account for abiogenesis by the overwhelmingly impossible odds of chance, scientists began to explore the possibility that life originated through some necessity by chemical attractions and other means.
- Dr. Dean Kenyon (in Biochemical Predestination, a leading college textbook, 1969), proposed that chemical attraction between amino acids could account for the assembly of proteins.

- Kenyon eventually recognized that DNA (information) directs the construction of the amino acids into proteins rather than chemical attraction of some sort.
  - "Amino acids do not have the ability to order themselves in any biologically meaningful sequence." -Kenyon-
  - The ordering of amino acids into proteins is the result of information contained within the DNA.
- Kenyon became one of the original personalities in the Intelligent Design (ID) movement.

17 **Attempts to Explain the Origin of Life**

- Dr. James Tour on Origin of Life Research
- Dr. James Tour is a synthetic organic chemist with over 650 published research papers and 120 patents. He has been awarded Scientist of the Year by R&D Magazine, and listed among the World's Most Influential Scientific Minds by ScienceWatch.com. His specialty is nano-technology—the designing and manufacturing of molecular machines. As such, he is eminently positioned to evaluate claims of origin-of-life research and how the molecular structures in living cells may have arisen.
- Tour points out that all living cells require at least four things: carbohydrates, nucleic acids, lipids, and proteins.
- Given the immense difficulty of assembling such molecules, even in the modern laboratory, Tour argues that it appears probabilistically impossible for things like carbohydrates, nucleic acids, lipids, and proteins to have arisen spontaneously in the pre-biotic world.

18 **Attempts to Explain the Origin of Life**

- Dr. James Tour on Origin of Life Research (cont.)
- Remember, Tour points out, that nature had no sterile laboratory, no climate controlled environment, no "target" of what it wanted, no way to stop once it had constructed a necessary molecule, no way to prevent destructive cross-reactions from other chemicals present in the environment, no way to access a necessary chemical in a neighboring pond or on a neighboring planet, no way to start over each time it failed.
- He says, "Origin of life (OoL) research is a retarded field of science. Little has advanced in the field since the highly touted 1952 Miller-Urey experiment. After two-thirds of a century, the world is no closer to generating life from small molecules, or any molecules for that matter, than it was in 1952. One could argue that OoL research is even more befuddled than it was in 1952 since more questions have arisen than answers."

- Tour argues that even if, against overwhelming odds, things such as carbohydrates and other essential molecules of every living cell could arise by chance in some pre-biotic "soup," you would still need to build a cell, constructing a semi-permeable membrane, adding each essential feature in just the right quantities, in just the right places, at just the right times, in the amount of time most scientists believe allowed by their estimated age of the earth.

19 **3. Proteins or DNA: The Chicken and the Egg**

- Two essential elements or building blocks of all living organisms are DNA and proteins.
  - DNA is essential for the building of proteins.
  - But protein is necessary to produce DNA.
- Which came first? Both had to be in place simultaneously for the first life to exist.

20 **4. Information: Where Did it Come From?**

- All living organisms have two kinds of information contained within their cells.
  - Genetic information: That which is contained within the structure of the DNA molecule, the gene.
  - Epigenetic information: That which lies above or beyond (epi) the gene.
- What causes or generates this information?
  - There exists no known material source of information. Matter may convey information (e.g. ink on a written page), but it does not generate information.
  - Uniform and repeated experience, without exception, tells us that information is always agent-caused. Minds generate information. We know of no other source.
  - Science recognizes this in anthropological research and its Search for Extra-Terrestrial Intelligence (SETI) project.

21 **5. Assembly: How to Build a House?**

- Even if it were possible to construct amino acids from the pre-biotic atmosphere, or to assemble amino acids into proteins by chemical attraction, that would still leave by far the greatest obstacle: how could those "building blocks" be assembled into even the simplest living organism?
- Someone could perhaps be able to make a brick. It is another matter altogether to be able to build a skyscraper.

22 **Conclusion**

- Naturalism has no viable explanation by which to account for the origin of life.

- Scientific evidence points to a source of life (an intelligent mind) compatible with the biblical account: An agent as the source of information with the power and intelligence to assemble the first parts according to that information.

23 **Next Week:**

- The Origin of the Species
  (Evolution)