

THE ORIGIN OF LIFE ON EARTH

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The DNA-protein relationship is analyzed in relation to the origin of life. Evidence for the modern evolutionary theory of spontaneous generation and evidence for creation are analyzed. Definition and scientific adequacy of these two views are considered. The work of Miller, Fox, and Oparin is reviewed. Concepts of time, chance, and chemical selection are evaluated and the concept of "imposed relationships" is introduced as evidence supporting Biblical creationism.

Concept of Spontaneous Generation

In man's quest to understand the nature and origin of life, one idea occurs again and again: spontaneous generation. This is a concept generally including the theory that all life on earth arose ultimately and naturally or "spontaneously" from nonliving matter. The current version of spontaneous generation is succinctly summarized by Paul B. Weisz in a widely adopted college biology text:

Living creatures on earth are a direct product of the earth. There is every reason to believe that living beings owe their origin entirely to certain physical and chemical properties of the ancient earth. Nothing supernatural appeared to be involved—only time and natural physical and chemical laws operating within the peculiarly suitable earthly environment. Given such an environment, life probably had to happen.¹

Several other high school and college biology text book authors make similar claims,^{2,3,4} so it is easy to see why spontaneous generation is accepted by many people as the modern, scientific theory of life's origin.

This "modern, scientific" theory, however, is easily discernible in the third century B.C. writings of Chung Tzu:

The harmonious cooperation of all beings arose, not from the orders of a superior authority external to themselves, but from the fact that they were all parts in a hierarchy of wholes forming a cosmic pattern, and what they obeyed were the internal dictates of their own natures.⁵

Though separated by twenty-three centuries and all the discoveries of molecular biology, Dr. Weisz and Chung Tzu are agreed that life originated without the aid of the "supernatural" (Weisz) or "a superior authority external to themselves" (Chung Tzu).

In his phrase, "harmonious cooperation," Chung Tzu has even captured the essential difference between life and non-life as molecular biologists may view it.⁶ Chung Tzu would no doubt agree with Dr. Weisz that the "harmonious

cooperation" of molecules within living systems owes its origin entirely to "natural physical and chemical laws" (Weisz), or to parts following the "internal dictates of their own natures" (Chung Tzu).

Twenty-three centuries, then, have seen no basic change in the belief that simpler elements, by natural process, spontaneously generated the properties distinctive of life on earth. But the same twenty-three centuries have seen dramatic changes in our knowledge of life. It is therefore appropriate to ask: is the modern version of spontaneous generation supported, refuted, or left undecided by what is presently known of biological chemistry?

Evidence for Spontaneous Generation

Evidences for the modern theory of spontaneous generation are often discussed (either explicitly or implicitly) under four headings. Each topic corresponds to a phase in what is presumed to be a continuous sequence of chemosynthetic, evolutionary development.⁷

(1) **Phase 1** is the combination of small, inorganic molecules (e.g., water, methane, ammonia) to form small organic molecules (e.g., sugars, amino acids, nucleotides). This process presumably began billions of years ago under conditions quite different from those on earth today.

(2) **Phase 2** is the combination of small, organic, Phase 1 molecules to form larger molecules (e.g., starch, protein, and nucleic acid chains).

(3) **Phase 3** is the union of larger, Phase 2 molecules into aggregates or coacervates having a tendency to maintain some structure and to absorb smaller molecules.

(4) **Phase 4** is the appearance of the first life forms, "super-aggregates" or "proto-cells" able to harness energy for their own maintenance, replication, and mutation. The driving forces culminating in the origin of life during Phase 4 are considered to be only time, chance, and a chemical version of natural selection acting upon molecules following the "dictates of their own natures" as reflected in the current laws of physics and chemistry.

Couched in the language of contemporary chemistry, the theory is logical, appealing, easy to visualize, and much evidence can be cited in favor of it.

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Phase 1. There is certainly evidence supporting the *plausibility* of Phase 1, the natural, “*ex vivo*” or “outside life” combination of inorganic into organic molecules. Stanley Miller simulated assumed, early earth conditions in a laboratory apparatus, and he and other workers have obtained sugars, amino acids, and nucleotides from inorganic precursors.

It might be objected, however, that new geological data may be used to argue against Miller’s original assumptions regarding early earth conditions⁸, or that the argument is somewhat circular since the conditions may have been postulated anticipating the results obtained. Wöhler’s *ex vivo* synthesis of urea in 1828 and the whole development of organic chemistry have shown clearly that organic molecules do behave in *chemical* ways. The question remains: will organic molecules spontaneously begin to behave in *biological* ways, as parts in “harmonious cooperation.”

Phase 2. Certainly one feature distinguishing “biological chemistry” from “chemical chemistry” is the influence of protein enzymes. Given an array of small organic molecules, what evidence do we have that these could spontaneously combine to form enzymatic proteins?

The answer here depends upon whether the formation of *any* protein is being considered, or the formation of some *specific* protein. Sidney Fox has actually produced peptide chains by “simply” heating mixtures of amino acids. His results represent only an ordinary chemical expectation for the reactants and level of thermal energy selected for the experiments.

Dr. Fox’s production of various proteinoids under such conditions, however, might be used to argue *against* spontaneous generation. His proteinoids would, of course, possess the general properties of colloids. Although *specific*, appropriate catalysis is surely necessary for life, *general* catalysis might actually favor the destruction of any evolving life; catalysts only hasten the achievement of equilibrium without affecting the balance point of a reaction, and an organism at equilibrium is a dead organism.

Particularly dangerous among the randomly generated Phase 2 proteinoids would be polymerases, enzymes catalyzing the formation of more enzymes. Dean E. Wooldridge of the California Institute of Technology seems to claim such “autocatalytic” enzymes as a real evolutionary advance⁹, but Richard Dickerson of the same institution explains why no living system can tolerate such polymerase enzymes:

The reason is easy; such enzymes would be too dangerous. Enzymes, like all catalysts, speed up forward and reverse reactions equally and accelerate only the drive toward equilibrium. Polymerases are also depoly-

merases. An enzyme that would link two amino acids to form a peptide bond would just as readily break one already formed. With the immense number of peptide bonds present in the protein of an organism, simple mass-action arguments will show that such an enzyme would spend most of its working life as a depolymerase and would work havoc on its host.¹⁰

Dr. Fox’s Phase 2 proteinoids, then, would work havoc on any evolving life simply because of their tendency to promote equilibrium and the accumulation of stable and low energy molecules. Apart from the influence of life, “chemical chemistry” is largely equilibrium chemistry, but “biological chemistry” is largely steady state chemistry based upon the continual input of raw materials and energy into a system capable of harnessing such input to maintain a pool of relatively unstable and continually interacting molecules.¹¹

Please note that the key to biological steady state chemistry is not the energy, but the harnessing system. The energy for many biochemical processes is supplied by ATP. ATP has been produced in Stanley Miller’s apparatus, and phosphate energy has been used by Dr. Fox to obtain proteinoids at lower temperatures. Phosphate energy, however, can be used for both synthesis and destruction of large molecules, and living systems actually “protect themselves” against the dangers of phosphate energy by closely regulating its quantity and distribution.

But just like the potentially destructive force of a gasoline explosion can be harnessed to power automobiles, so phosphate energy can be harnessed to power living systems by appropriately specific enzymes acting in a steady state context. No one supposes that gasoline explosions generated systems capable of harnessing gasoline explosions, and there is no *a priori* reason to suppose that biochemically dangerous phosphate energy generated systems capable of harnessing phosphate energy.

Given a spontaneously generated energy supply, the problem remains: would natural processes spontaneously produce the ordered enzymes and enzyme systems that life on earth requires to harness such energy? Without appropriate enzyme direction, Miller’s phosphate energy and Fox’s generalized proteinoid catalysts would only seem to inhibit the production of life-like systems in the “primordial soup,” and the whole process at Phase 2 would become strongly self-limiting.

Selection is often introduced into the discussion at this point, and claims are made that systems capable of harnessing energy would tend to persist and increase in number. Selection, however, is only a “hindsight” concept that explains the probable survival of a system already originated; selection itself supplies no reason for, or

clue to, the origin of the system for which the survival value is being considered.

The question remains: can the natural processes of time and chance molecular collision produce combinations of molecules with some evolutionary survival value? It seems that time is too short and the odds too long to permit such a view. In a reference text on enzymes, Dixon and Webb put the case simply:

First, the number of proteins of average molecular weight possible is 10^{650} .

Second, assuming conditions more favorable than those postulated, the equilibrium concentration of any particular protein would be only 10^{-99} M, i.e., only one molecule in a volume one hundred trillion trillion trillion times that of the earth.

Third, if the whole weight of the earth were protein, less than 10^{47} of the 10^{650} possible proteins could exist simultaneously, so the odds of finding two proteins of the same kind, even in a mixture the size of the earth, is vanishingly small.

Changing every protein in this mixture every second for five billion years, which is only 10^{17} seconds, would allow pre-biotic systems to sample less than 10^{64} proteins, an infinitesimally small fraction of 1% off all possible proteins. These figures, of course, can be variously "juggled," but it is not surprising that Dixon and Webb introduce their short section on the origin of enzymes by stating: "To say airily, as some do, that whenever the conditions are suitable for life to exist, life will inevitably emerge, is to betray a complete ignorance of the problems involved."¹²

Scientists are not, of course, ignorant of the problems involved. A. I. Oparin, the Russian biochemist who "fathered" the modern theory of spontaneous generation, even wrote: "To the student of protein structure the spontaneous formation of such an atomic arrangement in the protein molecule would seem as improbable as would the accidental origin of the text of Virgil's "Aeneid" from scattered letter type."¹³

In a recent Wistar Institute symposium, an international group of distinguished scientists grappled with the serious mathematical challenges to evolutionary thought.¹⁴ Several of the participants admitted severe weaknesses in current evolutionary theory, but all seemed confident these difficulties would be resolved by new discoveries or new insights within the evolutionary framework.

Such faith in future support for a theory is a valid and vital part of science. Because finite minds can never include all relevant data or exclude all alternate theories, "truth" in science always remains in the indefinite future. The severe chemical, selectional, and mathematical problems encountered as a result of demonstrated Phase 1 and Phase 2 processes make it impossible,

however, for a scientist to say that present evidence supports the modern theory of spontaneous generation.

Phase 3. Phase 3 involves spontaneous formation of molecular aggregates with some life-like properties. Every housewife who has made "Jell-O" or used soap to "float away" skillet grease or mixed up a "Good Seasons" salad dressing has watched organic molecules form membranes and more or less stable aggregates rapidly and spontaneously. Indeed, aggregation, fission, pulsation, and movement can be observed with a blob of mercury under appropriate and simple conditions. Formation of crystals, of course, is the most dramatic example of spontaneous appearance of order.

According to the Second Law of Thermodynamics, a price must be paid for spontaneous appearance of order. A high price is paid, for example, by the tobacco mosaic virus (TMV), which can spontaneously re-assemble after being shaken apart.

First, a tremendous amount of energy and machinery (supplied by a living tobacco leaf cell) is required to form the 2130 ornately sculptured proteins whose specific distribution of facets and electrical charges make the self-assembly possible. Second, the assembly of these exquisite proteins proceeds with a decrease in free energy, so the assembled form represents an equilibrium condition of relatively low free energy. Hence, the virus is dead, i.e., incapable of any further meaningful transformations of energy.

The ability of molecules to form various aggregates, then, is not distinctive of life; it is, rather, a property common to both living and non-living systems. Phase 3 demonstrations, like those for Phases 1 and 2, have only shown that organic molecules behave in chemical ways. Still lacking is a demonstration that organic molecules will begin spontaneously to behave in biological ways, i.e., as parts in "harmonious cooperation" harnessing energy for their own maintenance, replication, and mutation.

Phase 4. Phase 4 deals with the origin of this "harmonious cooperation," the transition from chemistry to biology and from nonlife to life. Twenty-three centuries ago, Chung Tzu asserted that the "harmonious cooperation" distinctive of life would result from parts following the "dictates of their own nature" and "not from the orders of a superior authority external to themselves."

Is there any evidence to support this ancient assertion, or its modern counterpart? Is there any evidence that life on earth resulted from time, chance, and selection acting upon molecules following the "dictates of their own natures" reflect-

ed in the current laws of physics and chemistry? The answer, quite simply, is no.

There is no evidence at all that natural processes and two to five billion years spontaneously generated the life on earth.¹⁵ What we have, indeed, is evidence exactly contrary—evidence that molecules in living systems interact in “un-natural” ways that are contrary to the “dictates of their own natures” and actually imposed upon them by “a superior authority external to themselves.”

Evidence for Creation

The most striking example of such an “un-natural” relationship is that between DNA and protein. Central to current molecular biology is the well supported theory that the sequence of bases in DNA (or RNA) molecules determine the sequence of amino acids in particular proteins, and this relationship is considered the basis for growth and development in viruses and all known life forms.

This absolutely vital relationship, however, is neither direct nor “natural.” The observed relationship is between the bases of DNA and the variable “R” groups of amino acids. There is, however, no chemical reason at all to suspect any sort of regular relationship between single and double ring bases and R groups that vary from a hydrogen atom to methyl, alcohol, sulfhydryl, acid, base, and ring groups.

Left to themselves, primordial DNA fragments and amino acids might be expected to form some sort of base-acid or acid-base relationship,¹⁶ and this natural chemical relationship would actually hinder the development of the “un-natural” relationship observed. Most significantly, the observed relation *necessitates a translation* process to establish the base-R group relationship (and to prevent the natural tendency of DNA bases and amino acids to react in the “wrong way”).

One translation molecule apparently employed by living systems is transfer RNA, one for each amino acid. But transfer RNA has no general tendency to combine with amino acids in any meaningful fashion, and no way at all to recognize the specific amino acid whose code name it bears. In present living systems, this “un-natural” combination of a *specific* transfer RNA with a *specific* amino acid is brought about by a *specific* activating enzyme which “recognizes”:

- (1) the R group of the amino acid, and
- (2) the codon bases of the transfer RNA, while at the same time holding the two molecules so that (3) the acid of the amino acid (already energized by the addition of AMP) can be coupled to (4) the sugar portion of a non-codon nucleotide of the transfer RNA.

This activating enzyme—the only molecule that “understands” the “un-natural” relationship between bases and the R groups of amino acids—

is a very highly ordered molecule including a necessary minimum of four active sites (five, if the AMP energy site is included). A molecule as highly ordered as the activating enzyme is not, of course, the sort of molecule likely to occur as a Phase 2 proteinoid, and several such molecules would be required to make even simple proteins.

Furthermore, the problems in establishing the “un-natural” relationship between DNA and protein only begin with activating enzymes. The amino acid coupled to its transfer RNA must still be coupled to another amino acid, the specific amino acid designated by the next codon in the informational base series.

In present living systems, this process involves ribosomes, ornately complex particles of several RNA and protein molecules including enough active sites properly spaced to (1) read an informational base series one codon at a time in the correct sequence, (2) hold onto a transfer RNA and remove its amino acid, and (3) hold one amino acid in position to combine with the next as the ribosome moves on to the next codon.

Several transfer RNA's and activating enzymes and at least one ribosome seem to be minimal requirements for making amino acid sequences from base sequences, not just “trim” for speeding up a natural process or elaborating on simpler systems. All these components, or several equivalent, imaginary “super coupling enzymes” of equal or greater complexity, would be needed to establish the observed continuing “un-natural” relationship between a particular series of bases and a particular series of amino acids, and this “un-natural” relationship is the basis of all life on earth.

What do I mean here by “un-natural”? Do I mean that the cellular relationship between DNA and protein violates the laws of physics and chemistry? No, not at all.

I mean these laws are fundamentally *irrelevant* to the problem of the *origin* of the DNA-protein relationship, just as Ohm's law and other laws relating to electricity are fundamentally irrelevant to the origin of a television set. No laws of physics are violated in the *operation* of a television set, but the operation of Ohm's law, etc., over any period of time does not explain the origin of the television set.

Indeed, an objective observer would have no trouble ascertaining that a television set is an “un-natural” or “un-spontaneous” relationship of wires, tubes, cathode rays, etc., a product of “something” familiar with the laws of physics, but not a product of the laws themselves, or of copper ore, glass, phosphorus, etc., following the “dictates of their own natures.”

That is, an objective observer would conclude that the relationship among the parts of a television set is an “un-natural” one *imposed* upon

the parts of the system by something "external to themselves." I am suggesting that biologists, for similar reasons, should conclude that life on earth is a "manufactured product," a system of relationships imposed upon matter by "a superior authority external to themselves."

Please note that I am neither "arguing from design" nor from the mathematical complexity of the relationships involved; I am arguing from the *kind* of relationships observed. Consider, for example, a geologist traveling through the West. He finds two columns of rock side by side, each column bearing a striking resemblance to a man in outline.

On one column, the nose, ears, chest, and other such prominent points in the outline are made of hard, weather resistant rock, and the neck and grooved regions of the body are made of soft rock, easily weathered. The appearance of such an ordered and improbable relationship could easily be explained by time, chance, and the natural processes of weathering.

The other column appears no more ordered or improbable, but the geologist finds that many prominent features are of soft rock, and many apparently more worn rocks are harder. Because of the "un-natural" relationships in the second column, the geologist would drop any thought that the column was formed spontaneously, and he would quite easily conclude that the column had been manufactured, perhaps carved by Indians.

I am suggesting that biologists, because of the kind of relationships among molecules in living systems, should conclude life on earth, like the second rock column, is a "manufactured product."

Scientific Explanation

Biological data currently available may be used to argue significantly that life on earth has descended from life forms originally manufactured by "a superior authority external to themselves," so it is reasonable to consider that life was authored by the Lord God, even Jesus the Christ, a possibility opened to our minds by the Bible (John 1 and Genesis 1 and 2).

Unfortunately, many biologists regard the Biblical explanation of life's origin as "unscientific," and even Christians try to "harmonize" science and the Bible by saying that God created and that spontaneous generation scientifically explains how He created. The modern theory of spontaneous generation, however, offers no scientific explanation at all for the origin of life on earth.

The factors presumed to explain the spontaneous origin of life are time, chance, and a form of natural selection operating on some "primordial soup." Time is the most disappointing element in spontaneous generation. The maximum of five

billion years allowed for the process is only 10^{17} seconds or 10^{23} millionths of seconds, insignificant figures compared to improbabilities reaching far beyond the 10^{1000} level arbitrarily designated "impossible" on some computers. Dr. Schützenberger found such a computer just "jammed" when he tried it with an evolutionary problem much simpler than life's origin.¹⁷

Nor will time produce slowly the same biochemical reactions that today occur rapidly because of enzyme help. Though free from competition with existing life, any evolving biochemistry would not be free from substrate competition or from competition with hydrolysis, both demanding fairly rapid, directed syntheses. More importantly, time is not a force that can make molecules behave in a consistently "un-natural" way, and this is the sort of force that seems required to originate the "harmonious cooperation" that living systems then perpetuate.

"Chance," the second element in spontaneous generation, can be a deceptive concept. When "chance" refers to Phases 1, 2, and 3, it usually means, "what would be the probability of natural chemical and physical processes producing a significant quantity of some molecule or aggregate," a scientific use of the word "chance."

Put in Phase 4, the meaning of "chance" changes. To ask, "what are the chances that DNA and protein will establish a relationship through necessary translation intermediates" is to ask, "what are the chances that the natural operation of chemical and physical laws will be violated over a series of events." "Chance" here has a mystical rather than scientific ring, and is devoid of explanatory value.

Mathematical odds, of course, can be calculated, but it is like calculating the odds that a Roman candle, randomly fired, could put a man on the moon. The odds of hitting the moon rather than some other area of space could be calculated, but such an abstract figure would fail to recognize that a Roman candle does not have the empirical potential to reach the moon.

Similarly, the forces imagined to produce the DNA-protein relationship are insufficient for the task. But as Saki wisely observed: "When once you have taken the impossible into your calculations its possibilities become practically limitless."¹⁸ Those who use "chance" to argue that "anything is possible" have reached the antithesis of science, whose laws are based upon the assumption that some things occur and others do not.

Selection is the final and distinctive element in the evolutionary view of life's spontaneous origin, but Darwin himself seemed to recognize that natural selection never was, and never could be, an explanation of origin. As a "hindsight" concept selection only attempts to explain how

certain trait combinations survive once they have somehow originated. (Darwin accepted, perhaps reluctantly, the now discarded pangenesis theory of origin of variations.)

The selectional argument, for example, that those aggregates which developed the ability to replicate increased in numbers sounds meaningful, but offers no explanation at all of how the aggregates originated their replicating fitness. In a lecture series at Haverford College, Manfred Eigen of the Max Planck Institut für Physikalische Chemie described a feedback system in which a series of nucleotides produced a series of amino acids which, in turn, induced the nucleotide series to form another amino acid series much like the first.¹⁹ Dr. Eigen elegantly showed such a system would possess, for physical reasons, a selectional advantage promoting its own increase in numbers.

He began his argument, however, by saying, "if we assume" a series of X's and a series of Y's interacting in a feedback process. It is this assumption, however, that is the key issue, especially since the nucleotide (X) to amino acid (Y) translation necessarily involves complex and "unnatural" intermediate steps. When I asked him afterwards how the relationship between nucleotide and amino acid series was originally established, Dr. Eigen replied that this was indeed the key difficulty.

Besides failing to solve the key difficulty in spontaneous generation theory, selection at Phases 1, 2, and 3 might actually operate *against* spontaneous generation. Biological selection basically differentiates between organisms each acting as if it were striving to survive.

Chemistry, however, is concerned with molecules interacting as if they were striving to attain low energy, stability, or equilibrium. So, chemical selection in Phases 1, 2, and 3 would tend to accumulate relatively stable molecules at the expense of the labile molecules required by living systems.

The somewhat mystical, scientifically inadequate²⁰, nature of the modern theory of spontaneous generation is eloquently indicated by a well known writer on evolution, Loren Eiseley:

Men talk much of matter and energy, of the struggle for existence that molds the shape of life. These things exist, it is true; but more delicate, elusive, quicker than the fins in water, is that *mysterious principle known as "organization,"* which leaves all other mysteries concerned with life stale and insignificant by comparison. For that without organization life does not persist is obvious. Yet this organization itself is not strictly the product of life, *nor of selection.* Like some dark and passing shadow within matter, it cups out the eyes' small windows or

spaces the notes of a meadow lark's song in the interior of a mottled egg. That principle—I am beginning to suspect—was there before the living *in the deeps of water.*²¹
(Emphases added)

The current theory of spontaneous generation, then, offers no scientific explanation at all for life's origin. Instead, it presents an implausible, deceptively easy to visualize, sequence of events fundamentally inconsistent with inherent assumptions about the adequacy and uniform applicability of present statistical, chemical, and selectional laws.

The Biblical explanation of life's origin is much more scientific. First, the data of biology are interpreted very reasonably from the position that earth's life originated as a result of "a superior authority external to themselves," and the Bible opens to our minds that God in Christ is that "superior authority." Dr. Eiseley comes very close to an independent assertion of the Biblical thesis when he seeks for a "mysterious principle" of "organization" in the "deeps of water." These are phrases that will remind many of the Genesis description of the Spirit of God moving over the chaotic deep before He "organized" the world.

Second, the Bible, by objective standards, represents at least a small part of the data pertinent to a discussion of life's origin, and there is no logical reason to dismiss its statements without examining them. So, even though the Biblical identification of the Lord God as Creator can nearly be arrived at inductively, it is legitimate for some intrigued by the Biblical thesis to begin a deductive investigation of its agreement with nature.

Third, there is much agreement between the Biblical account of life's origin and the present data of biology. Both the evolutionary and the Biblical concepts agree, for example, that living systems are fundamentally ordered "dust of the ground," forms not unique in substance but in organization or "harmonious cooperation."

Fourth, the Biblical explanation of life's origin is scientific because it encourages testable deductions and stimulates further research. Some, for example, are stimulated by the Biblical account to suppose that man, the image of the Creator, has the potential to form a kind of life from "dust," an exciting and practical field of research. Others see in the Biblical comments on "kinds" the possibility of an objective taxonomy based upon experimental tests rather than the often contradictory and subjective evaluations of experts. Still others deduce from the Biblical account hypotheses of fossil formation and distribution much more consistent with fossil data than current evolutionary interpretations.^{22,23,24}

"Creationism" stands between the extremes of "vitalism" and "mechanism," a synthesis of both

the possibility of supernatural origin and natural operation. For the scientist whose mind is open to the discovery of imposed or "created" relationships, biology becomes a scientist's dream: a highly ordered system of relationships which has coherence, understandability, and meaning guaranteed by God Himself. Neither spontaneous generation nor the Biblical explanation of life's origin is completely empirically testable, but, because of its high view of the orderliness of nature and its ability to integrate the data of biology and to stimulate research, the Biblical explanation is certainly scientific.

The God-centered view of life will not be accepted as scientific, however, if "scientific" is confused with "materialistic." A. I. Oparin, the father of the modern concept of evolutionary spontaneous generation, never even considered the possibility that life properties arose by the orders of "a superior authority external to themselves." Even before he begins to present evidence for his theory, Dr. Oparin announces his conclusion as follows:

Engels shows that a consistent *materialistic philosophy* can follow only a single path

in the attempt to solve the problem of the origin of life. Life has neither arisen spontaneously [in the sense of quickly] nor has it existed eternally. It must have, *therefore*, resulted from a long *evolution* of matter, its origin being merely one step in the course of its historical development.²⁵ (Emphases added)

For those whose minds are not closed to the possibility, the God-centered view of life offers rich treasures. To the scientist, the Bible offers a highly ordered and meaningful world developed according to "Logos," the Divine Plan, or the Word, for:

In the beginning was the Word [Logos], and the Word was with God, and the Word was God. He was in the beginning with God; all things were made through him, and without him was not anything made that was made. (John 1:1-3)

To the person, the Bible offers a personal world, for "the Word became flesh and dwelt among us, full of grace and truth" (John 1: 14), having come, as Jesus said, so that we might "have life, and have it abundantly." (John 10: 10).

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