are no rational (corporeal) beings outside the Earth. In that case, we might venture to suggest that there are not many irrational beings. For it seems to have been Gods purpose to put rational beings in charge of His Creation, to ". . . have dominion . . . over every living thing that moveth. . ."[27]. This argument might, perhaps, not exclude a few bacteria or lichens. It may be that, on questions of this sort, we can reach only probable conclusions.

It may be proposed that there must be rational corporeal living beings somewhere outside the Earth, for they have visited us, e.g. in flying saucers better called "unidentified flying objects" or simply UFO's. However, the evidence for UFO's is certainly not conclusive.[28]

Even if it be granted that UFO's are real, it does not necessarily follow that they have come from outside our Earth. It is difficult to imagine a technically advanced race living on any of the other planets of the solar system. As for other planets, if there be any suitable ones, belonging to other stars, the problem of getting here from such distances would surely be very great. So the reality or otherwise of the UFO's has no necessary bearing on the question under consideration.

In final conclusion, then, it may be said that such evidence as may be obtained, 1. from general considerations, 2. from scientific observations, and 3. from Scriptural considerations are against the existence of rational corporeal living beings outside the Earth.

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[4]See 1969 reports in *Icarus,* 11:139.
[5]Baked. R. H. 1950. Astronomy. Fifth Edition. D. Van Nostrand Co., Inc., p. 365.
[6]*Ibid.*. Sections 13.16 to 13.23.
[7]*Ibid.*, Sections 13.5 and 13.6.
[8]Molchanov, A. M. 1969. The reality of resonances in the solar system, *Icarus,* 11:104. See also references cited, and related articles in that issue.
[9]Baker, *Op. cit.,* Sections 11.15 to 11.19.
[10]*Ibid.*, Sections 15.15 to 15.19.
[11]John 10:16.
[12]Genesis 1:4.
[13]Genesis 6:13.
[14]Psalm 115:16.
[15]Romans 8:22.
[16]Romans 5:12.
[17]Romans 3:10.
[18]Acts 4:12.
[19]Colossian.s 1:19 and 20.
[20]Hebrews 9:22.
[21]Hebrews 9:28.
[22]Romans 6:9 and 10.
[23]II Peter 3:9.
[24]Ephesians 1:10.
[25]I Corinthians 15:21 and 22.
[26]Galatians 4:4.
[27]Genesis 1:28.
[28]Markowitz, William. 1967. The physics and metaphysics of unidentified flying objects, *Science,* 157 (3794):1274-1279. Markowitz presents an excellent case against these UFO's being under extra-terrestrial control. He concludes, "The control of reported UFO's by extraterrestrial beings is contrary to the laws of physics. The data published do not justify the holding of investigations." (p. 1278)

THE NATURE OF SPECULATIONS CONCERNING THE ORIGIN OF LIFE

DUANE T. GISH*

Though a majority of scientists believe that the origin of life was due to a natural evolutionary process, a significant minority disagrees.

By examining some important implications and limitations, prejudicial aspects of the materialistic position are made manifest with regard to some of the experimental work being conducted today in support of speculations on the origin of life.

Attention is given to the impossibility of the existence of many present day reagents on a primitive earth, and to weaknesses of many comparisons of precellular models of actual cellular conditions, before a five point enumeration is offered of problems that must be solved by a naturalistic approach.

> It is inherent in any acceptable definition of science that statements that cannot be checked by observations are not really *about* anything—or at the very least they are not science. (Simpson[1])
>
> . . . how life originated, I am afraid that, since Pasteur, this question is not within the scientific domain, at least if we consider probability as an essential part of a scientific statement. (Mora[2])

Due to the nature of the process, the origin of life by an evolutionary process could have left no record for man to investigate. Any organic compounds which would have been formed abiogenetically, and which remained available to organisms, would long ago have been degraded.

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As a matter of fact, the presence in sedimentary rocks of organic compounds related to those found in present day organisms is taken as proof that life existed when the rocks were formed.[3] Most geologists assume that most of the organic carbon present in the sediments has been derived from photosynthetic organisms.[4,5]

No Direct Evidence Possible Ever

Therefore, I must repeat that no one should ever hope to obtain direct evidence related to the origin of life. No amount of sophisticated research can ever succeed in lifting this area of thought above a highly speculative plane. One will forever be postulating what *may* have happened or what *could* have happened, but one will never be able to answer the question, what *did* happen?

If the criteria of Simpson and Mora are accepted, and these are the criteria usually applied to scientific work, then speculations and experiments related to the origin of life lie outside the scientific domain. Bernal[6] while discussing a paper by Mora said, ". . . Dr. Mora has shown that the principles of experimental science do not apply to discussions on the origin of life and indeed cannot apply in any problem of origin."

Nevertheless, since antiquity, man has been speculating concerning the origin of life (for a review of early speculations see Oparin[7], KeoSian,[8] and Dauvillier[9]), and during the past two decades, an increasing number of scientists have begun to devote serious study to this question. The volume of scientific literature dealing with this subject has increased greatly during the past few years, and several international symposia have been held.

Most investigators in this area have adopted the conviction that no supernatural agent was involved in the origin of life, but that its origin was inherent in the property of matter under the conditions which have existed on the earth since its creation. Rejection of any supernatural intervention in the origin of life is often given as the basis for accepting a materialistic hypothesis. Thus Schafer has stated,

> . . . setting aside as devoid of scientific foundation the idea of immediate supernatural intervention in the first production of life, we are not only justified in believing, but *compelled* to believe, that living matter must have owed its origin to causes similar in character to those which have been instrumental in producing all other forms of matter in the universe, in other words, to a process of gradual evolution.[10]

For the materialist, the fact that life exists is proof enough that it did evolve. Doubtless, a *majority* of scientists believe that the origin of life was due to a natural evolutionary process. There is a *significant minority*, however, who disagrees.

Nature of Materialistic Position

The materialistic hypothesis, as outlined by Keosian, applies natural laws to the explanation of the origin of life. Beginning with an imagined abiogenic synthesis of organic compounds, proponents of this theory propose that the origin of life was the result of a series of probable steps of increasing complexity, inevitably leading up to the living state. The origin of life is not viewed as a remote accident, but "the result of matter evolving to higher and higher levels through the inexorable working out at each level of its inherent potentialities to arrive at the next level."[11]

There seems to be some disagreement among evolutionists as to just how inexorable was the passage of matter through higher and higher levels until life arose. While many agree with Keosian that, given the properties of matter, the conditions postulated for the primitive earth, and the time postulated as being available, the origin of life was inevitable, others disagree. Urey has said,

> . . . the evolution from inanimate systems of biochemical compounds, e.g., the proteins, carbohydrates, enzymes and many others, of the intricate systems of reactions characteristic of living organisms, and of the truly remarkable ability of molecules to reproduce themselves, seems to those most expert in the field to be almost impossible. Thus a time from the beginning to photosynthesis of two billion years may help many to accept the hypothesis of the spontaneous generation of life.[12]

Simpson, in his paper on the nonprevalence of humanoids in the universe, and from which came the opening quotation of this paper, has said, "Only the astronomical assurance that there may be many millions of earth-like planets permits us to assume that the origin of true, that is of cellular, life may have happened more than once." If the origin of life on the earth was inevitable in the amount of time available, then some men argue that, of course, life must have inevitably arisen on every other earth-like planet. Simpson denies this position.

Several Important Implications

The hypothesis of the origin of life held by most contemporary evolutionists, and as outlined by Keosian, contains several important implications. The old idea that the origin of entire, complete living organisms was due to a sudden, chance arrangement of matter has been aban-

doned. It is now recognized by most investigators that the probability of such an occurrence is zero.

Instead of life originating by a one-step, pure chance process, the origin of life is envisioned as the result of a long series of events spanning many hundreds of millions of years. The probability of each of these steps, it is postulated, though low, had some finite value.

Another important implication of this theory is that the origin of life was due solely to the property of matter. Now the property of matter is something we can investigate, and matter must have the properties the theory implies if the theory is correct.

For example, if matter has inexorably evolved upward through higher and higher levels, then one of the basic properties of matter must be the tendency to organize itself into higher and higher levels. If this is a property of matter, then we should be able to design experiments to demonstrate it. If the origin of life involved a self-replicating molecule, this ability to self-replicate was due solely to the property of matter and its arrangement in the molecule, and such a molecule *should be* just as possible today as two billion years ago. We *should be* able to find such a molecule in nature or should be able to construct one.

It is proposed that the complex polymers found in the living cell, such as proteins and nucleic acids, arose spontaneously from the sub-units of which they are composed under conditions postulated to have existed upon the primitive earth. Supposedly, this polymerization would have been due solely to the property of the matter composing the sub-units and the polymer under the postulated conditions. Such properties can be investigated, and attempts are being made in this direction.

Limitations of Preconceived Ideas

One important consideration must be mentioned. That is the tendency of all of us to allow our judgement to be influenced by our prejudices and preconceived ideas. This is notably true in the area of evolution, as has been emphasized by various investigators. In discussing how often preconceived ideas have affected the investigation of human origins, Hawkins[13] points out how our greatest authorities were so badly fooled by the fraud known as "Piltdown Man."

Similarly, in his discussion of the mutation-selection theory, Martin[14] had this to say: "What is really disturbing to me, if I may presume to say so, is the almost total lack of scientific caution and self-criticism current in genetical circles, in regard to the accepted theory of evolution by mutation." After mentioning several textbooks, Martin continues,

> . . . the authors are all frank partisans of the accepted theory and almost completely devoid of a critical attitude. Their books are written entirely within the presuppositions laid down by the theory; they take it for granted and proceed to interpret a vast array of observations in its terms. Naturally their observations appear to confirm, or at least conform to, the theory. Such practices certainly will never bring any fallacies to light which the theory may contain, but will only serve to deepen the faith of the believer.

W. R. Thompson[15] has said, ". . . in science heresy is a virtue and a reaction often a necessity, and in no field of science are heresy and reaction more desirable than in evolutionary theory." The above observations can be applied today with especial emphasis with regard to experimental work being conducted in support of speculations on the origin of life.

Attention to Reagents, Energy Sources

Much work purportedly related to the origin of life has been conducted under conditions or with the use of reagents which could not have existed on any possible primitive earth. An example that may be cited in the production of adenine nucleotides by irradition of solutions containing adenosine and ethyl metaphosphate.[16] Ethyl metaphosphate is prepared by the reaction of phosphorus pentoxide with ethyl ether in chloroform and is rapidly hydrolyzed by water. This synthesis has no relevance whatsoever to the origin of life, yet this work was cited as evidence that nucleotides could have been produced in the primitive ocean.[17]

The degradative effects of the energy sources employed for syntheses allegedly related to the origin of life has been almost completely ignored by most investigators. As a matter of fact, one of the common features of most of these syntheses is the use of a device, such as a cold trap, to rapidly remove the products from the reaction site.

The inclination of an organic chemist to remove his product from reaction conditions which would lead to subsequent decomposition is understandable. Unfortunately, there were no organic chemists on the primitive earth to facilitate this removal, and products formed abiogenically would have been decomposed by the very energy sources that brought about their synthesis. Synthesis of amino acids by irradiation of a mixture of gases is interesting, but comparison of the rate of synthesis to the rate of decomposition would be critical in determining

whether this type of synthesis could have had any relevance to the abiogenic synthesis of amino acids.*

Weaknesses of Comparisons Noted

In some precellular models, properties of the polymer produced are compared to those of the naturally-occurring polymer in such a way as to render the comparison favorable, when in fact differences exist which are fatal to the model. For example, the properties of thermally produced polymers of amino acids reported by Fox and coworkers have been compared to those of naturally occuring proteins.[18,19]

Similarities were pointed out to support the belief that thermal polymerization was the principal synthetic method that produced proteins and other macromolecules on the primitive earth. However, serine and threonine are present in these polymers, or "proteinoids," in only trace amounts. Serine and threonine are found in abundant amounts in almost all naturally occurring proteins.

Any synthetic method which might have some relevance to the origin of life must account for the incorporation of amino acids into protein in approximately the proportion found today. Certainly, the incorporation into a synthetic polymer in only **trace** amounts of constituents which occur in **abundant** amounts in the naturally occurring polymer should force abandonment of the synthetic method as a possible mode of synthesis in any origin of life scheme.

Impact of Naturalistic Viewpoint

The naturalistic point of view which today dominates our society, and scientific activity in particular, guarantees favorable reception to almost anything which supports evolutionary theory. In the face of the present day abundance of manuscripts submitted for publication in technical journals, editors of these journals usually strive to limit publication to that material which is of significance and which has some reasonable scientific basis.

Some of the material which is appearing in technical journals today, however, indicates that criteria usually applied have been somewhat modified when articles considered contain support of some phase of evolutionary theory. One example of this is the total number of pages in journals and technical books devoted to photographs of the microspheres of Fox's proteinoids.[20] Some of these photographs were published to illustrate division of individual microspheres which *simulates* division observed in septate cocci,[21] structural features *similar* to bacteria, a "budding-like" process, and a "blastula-like" microsphere.[22]

The great importance attached to certain physical features of these microspheres, formed by the precipitation of amino acid polymers, which **resemble** features of some bacteria, reminds one of several works published about a half century ago:

(a) Using drops of olive oil in a solution of potash, Butschli[23] produced structures which threw out pseudopodia like amoebae, moving toward solid particles and even engulfing them.

(b) Leduc[24] used small pieces of melted calcium chloride immersed in saturated solutions of potash or tripotassium phosphate. Osmotic globules were formed, from the semipermeable membranes of calcium carbonate or calcium phosphate that were produced, giving structures that looked very much like algae.

(c) Herrera[25] carried out extensive studies on artificial structures which he produced. By mixing solutions of thiocyanates with solutions of formalin, for instance, Herrera obtained colloidal solutions of nitrogen-containing substances. When these were fixed with formalin, precipitation occurred and complex structures resembling cells were formed. Some of these artificial cells even had what appeared to be double membranes, also noted by Fox with some of his microspheres.

The features of Fox's microspheres which bear a **superficial resemblance** to such processes in living organisms as cell division, double membranes, and budding have no closer relationship to the actual processes in living cells than did the structures of Butschli, Leduc, and Herrera!! Yet Fox has assigned great importance to such features, and many other scientists and non-scientists have been equally impressed.

A naturalistic approach to the origin of life, must include solutions to the following:

1. Construction of a plausible primitive earth model based upon the best available evidence.

2. Description of chemical reactions which may have occurred under the above conditions, and the nature of simple chemical compounds which may have accumulated to a significant extent as a result.

3. Description of the formation, under the above conditions, of complex biologically important compounds, such as nucleic acids and proteins, and their accumulation in significant amounts.

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*Editor's Note: The reader might take particular note of the fact that *carefully planned* laboratory synthesis of biological material will in no way afford support for the *chance, accidental* origin of life imaginatively speculated as the beginning of supposed naturalistic, evolutionary processes by which life came into existence.

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4. The origin of stable, complex, metabolically active systems which were composed of "biologically active" proteins (such as enzymes), nucleic acids, and other metabolically active compounds, such as coenzymes and high energy phosphate compounds.

5. The origin of the first completely independent, stable, self-replicating unit-the first living cell.

Such solutions pose tremendous challenges to evolutionists, even to those who tend to take conjecture and extrapolation too seriously, and who have a tendency to confuse what they are saying with reality. I am personally under the conviction that man will never be able to comprehend how life may have originated. Its creation required a Mind infinitely greater than that of any man.

> Through faith we understand that the worlds were framed by the Word of God, so that things which are seen were not made of things which do appear. (Hebrews 11:3)

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table matter back into the oceans and thereby increase directly the amount of carbon in the carbon cycle. This value of 2.50 cm/sq. cm., divided into a pre-flood C-14 production rate of about 161 atoms/min-cm. (i.e. essentially the same as today) would give the SPR value of 64.4.

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