The basic structure of biochemicals consists of carbon atoms which are linked to other atoms, as hydrogen and oxygen. This fact raised the serious question of how life could have arisen spontaneously on a planet which was mostly covered with water - carbon and water do not mix. This means that the chemical steps to build larger and larger biomolecules could not occur in water.

It was known that some of the chemical characteristics of water change at high pressure and temperature. One team of scientists conducted than two thousand experiments in conditions like those several miles down in the earth.

The early experiments were unsuccessful, producing few useful kinds of biomolecules. But later experiments showed that the presence of certain minerals promoted the production of biochemical building blocks - and also helped to preserve amino acids that would have been broken down by the high temperatures.

As a result, a number of researchers have presented origin-of-life theories which depend on the ability of minerals to promote the combining of simple chemicals into the more complex building blocks of living organisms.

Radio astronomy has opened a new possibility in the minds of those engaged in origin-of-life research. It is possible to identify the presence of various kinds of material in the lab by the quality of radiation which it emits at high temperature. By the same spectroscopic analysis it is also possible to identify materials a great distance away by analyzing the radiation coming from them.

In this way a multitude of different kinds of chemicals have been detected in the molecular clouds of deep space. Most of what is detected are the smaller molecules of hydrogen, carbon dioxide and water. Many other kinds of larger, more complex molecules are also seen, which observers believe could have been gradually built up by the combining of smaller ones by radiation from a nearby star.

This ties in with another guess which men have made, on how they think the earth was made without the need for a Creator. It is called the nebular hypothesis, in which such molecular clouds are believed to collapse to form a star, with planets orbiting it as in the solar system.

A scientist working on research at NASA, Dr. John Chambers, described at a seminar the results of his study to determine how often newly forming planetary systems should be expected to produce Earth-like planets with the same sized sun as ours - see Rare Earth, p. x.

The Earth-like body must (1) be a rocky planet (2) with water on its surface, (3) orbiting the not-too-hot and not-too-cold distance from the star. This would provide the conditions to support the presence of liquid water and therefore life for a very long time. His answer: it would be rare.

The computer simulations concluded that a planet with only these three conditions would be seldom found. But there are many, many more conditions on Earth which make life as we know it possible - all the way from having a magnetic field - for protection against solar flare-emitted radiation and particles, to an atmosphere with just the right proportions. Add all these conditions and the probability, without the intervention of an intelligent Creator, rapidly hits zero.