# THE FIRST CHAPTER OF GENESIS AS THE ROCK FOUNDATION FOR SCIENCE AND RELIGION

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## CHAPTER I

### *The Cosmogony of Genesis and That of Science is the Same*

BEFORE considering the contents of this marvellous chapter it may be well to stop for a moment upon the popular conception concerning the ancient cosmologies.

Without dwelling upon the ideas of the Babylonians, Egyptians, the Indians and others, it is desirable here to mention only the supposed cosmology of the ancient Hebrews.

The most erroneous ideas are attributed to the sacred writers from such poetic expressions as "Hast thou with him spread out the sky which is strong and as a molten looking glass?"

Some think that this passage proves that Job thought that the sky was something like a brass vessel inverted overhead and scoured bright like an ancient mirror. This is one of a few passages upon which is based the idea of the ignorance of the ancients. But as opposed to this we quote again from Job (26:7, 8) "He stretcheth out the north over the empty place and hangeth the earth upon nothing. He bindeth up the waters in his thick clouds; and the cloud is not rent under them."

A little farther on in the same chapter (V. 13) he says "By his spirit he hath garnished the heavens; his hand hath formed the crooked serpent." In this he refers to the constellation, the Dragon. He speaks also of other constellations. Speaking of God he says, "Which maketh Arcturus, Orion, and Pleiades, and the chambers of the south." Again, "Canst thou bind the sweet influences of

the Pleiades, or loose the bands of Orion? Canst thou bring forth Mazzaroth in his season? or canst thou guide Arcturus with his sons?"

The constellations as we now have them were known and named hundreds if not thousands of years before the time of Moses. There is evidence that the constellations were already divided and named in the time of Enoch. Cassini commences his history of astronomy by saying "it is impossible to doubt that astronomy was invented from the beginning of the world." Sir William Drummond says, "the fact is certain that at some remote period there were mathematicians and astronomers who knew that the sun is the center of our system and that the earth, itself a planet, revolved around it."

In a recent article on Progressive Astronomy we read that Chaldea, Egypt, China, India, the Incas, the Aztecs, the Druids—all ancient peoples, back to prehistoric times, have observed the stars. The zodiac, or sun's path among the stars each year, the phases of the moon, the fixed constellations and wandering comets, the eclipses of the sun and moon and the conjunction of the planets were all known before Abraham left Ur of the Chaldees. Archaeologists have discovered, in Babylonia, multiplication tables as high, at least, as 1300, which were used, as Hilprecht observes, as we use logarithms and in astronomical calculations. It is very probable that the ancients knew as much about astronomy as we should know today without instruments.

The great pyramid of Egypt was built more than 600 years before the time of Moses, but an astronomer, taking a hint from that, calculated the distance of the sun within 270 miles of the results of the most accurate observations and calculations of the 19th century. The

builders of that pyramid knew the distance to the sun and left a record of their knowledge. Prof. Newcomb is right in the declaration that not enough credit has been given the ancient astronomers. There is no time within the scope of history when it was not known that the earth is a sphere.

As compared with the science of astronomy the book of Genesis is a recent work, and aside from any inspiration Moses was "Learned in all the wisdom of the Egyptians." Egypt, at that time, was the seat of the world's learning.

I have glanced at some of these facts to establish an antecedent probability that Moses knew something of what he was writing about even aside from any inspiration from on high.

There is reason, however, to believe that the original revelation concerning the creation was made to mankind ages before the time of Moses. The grotesque forms the story afterward assumed was the result of changes made by men who thought that they were too wise to accept it in its form as given, and so they modified it to suit their own wisdom.

Beginning now with the chapter, I pass over the first declaration, In the beginning God created the heavens and the earth, and pass to the condition of matter thus created.

The earth was "*tohu*," "*bohu*." These words are variously translated, as "without form," "void," or as Young defines them "emptiness," "vacancy."

There are probably no words in the Hebrew language that could more accurately define what science for the past 100 years declares to have been the primordial condition of the material composing our solar system. There

is every reason to believe that the writer used those words knowingly, and that he meant to convey the idea that it was in a very comminuted, dissipated form, not responsive to the sense of touch.

Without doubt this was the original condition of matter and if it were created in that form and then left to the operation of "natural law" as we should say, and physical forces, every phenomenon that scientists have since observed or proven to exist, would have followed in natural order and without further miraculous intervention. Further than this, there has been left recorded in nature the Divine plan and the Divine mode of operation.

Assuming, then, as a working hypothesis, that this was the first form of matter and that then it was left to the operations of natural law and physical forces, some things may be affirmed with certainty.

I. The nebulas must have been extremely tenuous. A moment's calculation would show that if it extended to the outmost known limits of our system it must have been at least 10,000 times as thin as common air at sea level. It must have existed as gas, vapor or dust. Gas is a form of matter whose particles seem to have the power of affecting other particles without actual contact as shown by sound and light. Vapor is a liquid in a state of minute sublivision and dust is a solid in the same condition. The nebula must have existed as one or more of these forms of matter. Above the temperature of 312 below zero, air exists as a gas. At that temperature it exists as a liquid, and perhaps at interstellar or absolute cold it would exist as a solid, and in nebula would be extremely comminuted. If this be true of air it certainly would be true of those

forms of matter that liquefy and solidify at much higher temperatures.

II. The nebula may have been either cold or hot.

The supposition used to be that it must have been originally at a temperature that would be required to return the system to that condition of tenuity. That assumption, however, is not essential to the theory. The concussion of condensation near the close of the process of star formation would produce more heat than there are traces of at present. If the temperature were originally very high, the nebula would have cooled with great rapidity, according to the law of radiation, from each separate particle with little hindrance by surrounding particles, rather than according to the law for the cooling of liquids or solids, in which heat must pass by conduction from the interior parts with radiation only from the surface. This is shown by the almost instantaneous cooling of gases formed by explosive compounds, in which the loss of heat is almost instantaneous. It is thus that the super-heated nebula would cool. The higher the temperature, the more rapid would be the process of cooling and the super-incumbent gases or other substances, though great in volume, would be so exceedingly tenuous as to offer but little resistance to radiation. If originally cold, as noted above, heat would be produced by the concussion of contraction and toward the close of the process of star formation the amount would be very great. In either case contraction could so proceed as to form a stellar system like our own.

III. Whatever its condition it must have been very much more dense toward the center. This must have been the case, at least when it existed within the boundaries of the present system. This conclusion is necessary

from the sizes of the planets. If the mass had been of equal density throughout, and Uranus and Neptune had taken their share of the material they would have taken from three-fourths to seven-eights of all the matter in the solar system—¾ if the nebula was diskoid, ⅞ if spherical. It was probably spheroidal as shown by the satellites of Uranus and Neptune. Instead, however, of having even ¾ of the matter in the system, the sun itself contains nearly 10,000 times as much as they both combined. The nebula then must have been indefinitely more dense in its central than in its external portions.

IV. It must have rotated upon its axis—at least its external portions, in about the same time that Neptune revolves around the sun. When it had contracted to the orbit of Uranus it must have increased its rate of rotation to that of the planet Uranus in its orbit. And so of all. As it contracted, its rate of rotations must have increased so as to equal, successively, the orbital velocities of Saturn, Jupiter and so on. The orbital velocity of Neptune is about 3⅓ miles per second, that of Uranus about 4⅓ miles per second. Contraction must have proceeded at such a rate as to have produced that increase in orbital motion.

V. It then becomes a very easy problem to ascertain the rate of contraction as it is simply one of resultant motion.

In the diagram, Fig. 1, if, say, a body were moving along the line *a b* at a rate of 20 miles per hour and some other force should drive it along the line *a d* at a rate of 10 miles per hour it would take the direction *a c* and its rate could easily be determined. So its impulse along the line *a d* could be found if its rate along *a c* were known and the impulse along the line *a b*. It would be