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Abstract: This article uses modern astronomy to corroborate the scriptures and the infinitude of God's creations.

ASTRONOMY AND ANCIENT AND MODERN SCRIPTURES

BY HON. JOSEPH A. WEST

Enoch, Abraham, and Moses must have been versed in astronomy for the Lord revealed unto them many things relative to the stars, as will be seen by reference to the Books of Moses, and of Abraham, in the *Pearl of Great Price*, the former revealed to Joseph Smith and the latter translated from Ancient Egyptian records by him. (See *History of the Church*, Vol. 1, pp. 98-101, June, 1830; Vol. 2, pp. 235-236, 348-351, December, 1835.) It is also evident that Job, and perhaps others of the early prophets and patriarchs, were acquainted with this subject for the Lord asked Job where he was when "the morning stars sang together and all the sons of God shouted for joy," (38:7) and further enquired, "Canst thou bind the sweet influences of Pleiades, or loose the bands of Orion?" (38:31.)

That modern conclusions on astronomy in many respects harmonize with the revelations of the Lord is quite evident; and the fact that Joseph Smith, who was at the time uneducated in the learning of the world, announced many astronomical truths, later reached by the learned, may be regarded as strong evidence that he was divinely inspired. For example:

An Inconceivable Number of Worlds

Upon a certain occasion the Lord showed Enoch the starry firmament, in great detail, and, in his great astonishment, he was led to remark:

"And were it possible that man could number the particles of the earth, yea, millions of earths like this, it would not be a beginning to the number of thy creations." (Pearl of Great Price, Moses 7:30.)

Unto Moses, the Lord said: "The heavens, they are many, and they cannot be numbered unto man." (Moses 1:37.)

While the words, "thy creations" may refer to many other things than worlds, they point mainly to what had been revealed in the heavens, *viz*: its innumerable planetary systems.

When these thoughts were first revealed, nearly a hundred years ago, the stars were not thought to be as numerous as they are known to be today. Astronomy now teaches that there are at least a hundred million of them, each of which is a sun, or the central planet, of a solar system, and that these systems each contain many worlds, some of which are larger than the orbit of our earth. Scientists have recently measured the distance to, and the diameter of, the great red star in the constellation Orion, known as Betelgeuse, and found to be 175 light years away, and its diameter to be 242 million miles. This

agrees with what the Lord told Abraham about some of the stars being very large as will be seen from a subsequent quotation.*

All Space Filled With Matter

Modern astronomy teaches that inter-stellar space is filled with cosmic dust, or disorganized world matter which, in the process of world creation, clusters together in what are called nebula, of which it is estimated there are a half million in different stages of world formation. This is called the nebular hypothesis of creation and is too lengthy for explanation here.

We infer from modern revelation that when God created this earth, he went out into space, supposedly far from the disturbing influence of other planetary systems, and, finding disorganized matter there, proceeded to organize it into a world.

Worlds Go Through Different Stages of Creative Development and Finally Pass Away

The Lord said unto Moses:

"For behold, there are many worlds that have passed away by the word of my power. And there are many that now stand, and innumerable are they unto man. * * * And as one earth shall pass away and the heavens thereof even so shall another come." (Pearl of Great Price, Moses 1:35, 38.)

Henry Smith Williams, in Volume I of his *Story of Modern Science*, says, concerning this phase of the subject, page 52 under the title, "The Life-Story of a Star:"

"A star is a body which is formed out of the cosmic mist of a nebula. The stages of stellar evolution are pretty clearly revealed by the spectroscope."

He then goes on to describe the various changes through which a star passes until it becomes a dark world, or, one borrowing its light from a central sun, like our earth in its present state, suitable for the abode of man. When it has lived its allotted time, it is destroyed, probably from internal explosion or by collision with some other world, and its elements are scattered throughout the universe as cosmic dust, to be taken up again in the formation of other worlds. He thus summarizes:

"There would seem to be no reason, however, why any given star might not undergo the process of collision, nebula formation, slow cooling, and extinction, over and over again."

He also says, after discussing in detail the process of world formation and transition:

"Thus may the cosmic race, whose aggregate census makes up the stellar universe, be perpetuated—individual solar systems, such as ours, being born, and growing old, dying to live again in their descendants, while

* (See also *Scribner's Magazine*, June, 1922; and January, 1924.)

the universe as a whole maintains its unified integrity—through all these internal mutations—passing on, it may be by infinitesimal stages to a culmination hopelessly beyond human comprehension.”*

Worlds Created as an Abode for Man

Among the wonderful and beautiful sayings contained in the 76th section of the Doctrine and Covenants, verses 22 to 24, inclusive, we have the following:

“And now, after the many testimonies which have been given of him, this is the testimony, last of all, which we give of him: That he lives! For we saw him, even on the right hand of God; and we heard the voice bearing record that he is the Only Begotten of the Father—that by him, and through him and of him, the worlds are and were created, and the inhabitants thereof are begotten sons and daughters unto God.”

Astronomers believe that many of the worlds, in the universe, are inhabited. Note the following from *The Story of Modern Science*, Vol. 1, page 9:

“Laplace and Herschell are honored for teaching that gravitation built up the system which it still controls; that our universe is but a minor nebula; our sun a minor star; our earth but a mere atom of matter, our race only one of the myriad races peopling the infinity of worlds.”

Why Was Our Earth Created as an Abode for Man?

The answer is given in the third chapter of Abraham, Pearl of Great Price, where, among other precious truths, it is said:

“Now the Lord had shown unto me, Abraham, the intelligences that were organized before the world was; * * * and there stood one among them, that was like unto God, and he said unto those that were with him: We will go down, for there is space there, and we will take of these materials. (Astronomers would perhaps call it cosmic dust) and we will make an earth whereon these may dwell; and we will prove them herewith, to see if they will do all things whatsoever the Lord their God shall command them; * * * and they who keep their second estate shall have glory added upon their heads for ever and ever.” (Verses 22-26.)

The Lord also said unto Moses:

“This is my work and my glory—to bring to pass the immortality

*“What a picture is thus presented to the imagination! Myriads of stars, many of them far larger than the sun, organized in a system so vast that light cannot traverse it in less than three hundred thousand years. Each star a powerful centre of attractive and repulsive forces, drawing into it, at meteoric velocities, all masses entering its neighborhood at moderate speeds; driving from it electrons and other minute particles, which its repulsion pursues into the most distant regions of the universe. Each particle, moving with millions of its kind through the highways and crossroads of space, or drawn with its companions into masses by mutual attraction, aiding to form great cosmic clouds, dark and obscuring when far from brilliant stars, luminous with the spectral hues of the lightest gases when exposed to intense stellar excitation. And this is but half the picture, for every particle of gas or dust is built of countless molecules, and these in turn of atoms, each comprising an ultramicroscopic world, in which the whirling electrons, like the planets of the solar system, move in their orbits about a positive nucleus—their central sun.”
—George Ellery Hale, in *Scribner's Magazine*, January, 1924.

and the eternal life of man." (1:39 Book of Moses, Pearl of Great Price.)

The Latter-day Saints do not go beyond reason when they believe that not only this earth but all the innumerable worlds in space were created ultimately to become a fit abode for God's spiritual children. They may thus obtain bodies and pass through a most valuable mortal experience. When death overtakes them they again pass into the spirit state and enter upon another probation, finally attaining to the resurrection, which constitutes the crowning event of their progressive lives.

The Lord revealed to Abraham the following:

"And I, Abraham, had the Urim and Thummim, which the Lord my God had given unto me, in Ur of the Chaldees; and I saw the stars, that they were very great, and that one of them was nearest unto the throne of God; and there were many great ones which were near unto it; and the Lord said unto me, "These are the governing ones; and the name of the great one is Kolob, because it is near unto me. * * * I have set this one to govern all those which belong to the same order as that upon which thou standest.

"And the Lord said unto me, by the Urim and Thummim, that Kolob was after the manner of the Lord, according to its times and seasons in the revolutions thereof; that one revolution was a day unto the Lord, after his manner of reckoning, it being one thousand years according to the time appointed unto that whereon thou standest. This is the reckoning of the Lord's time, according to the reckoning of Kolob." (Book of Abraham 3:1-4, incl., Pearl of Great Price.)

Astronomers teach that all planetary systems are traveling toward a common or central point, in a northwesterly direction, and at a very rapid rate. Our earth, for instance, is not only subject to its diurnal revolutions at a speed of over a thousand miles per hour, but in its annual course around the sun is traveling at the rate of nearly nineteen miles per second, and in its flight toward the center of the universe at the rate of twelve and one-half miles per second. Of these movements, called by astronomers "the proper movement of the stars," Smith says: "So the cycle process might conceivably go on forever; or until some unthinkable remote period of the future when all the gravitational matter in the universe has been aggregated into a single mass."

As to the time that it would take to accomplish this, should this be the ultimate program, he does not pretend to say, for time and space are so incomprehensible to the finite mind of man. But some idea may be obtained from the following:

Immensity of Space

A modern air ship traveling at the rate of a mile a minute would encircle the earth in seventeen days, would reach our nearest neighbor on the solar system, Mars, in ninety odd years, and the most distant planet, Neptune, in five thousand years. It would reach the nearest

star in fifty millions years and a star of average distance in from twenty to thirty billion years. It is no wonder, then, that astronomers have to adopt another standard of measure, *viz*: the light-years, when referring to the distances in this immense universe of which we form but an infinitesimal part. This unit, or light-year, as stated before is nearly a million million miles. Some idea of the immensity of space can be derived from the fact that the milky way is said to be from two to three-hundred light-years in extent.*

W. W. Phelps, a close friend of the Prophet Joseph Smith, in contemplating the immensity of the universe, wrote the following:

If you could hie to Kolob, in the twinkling of an eye,
And then continue onward, in that same speed to fly,

Do you think that you could ever, through all eternity,
Find out the generation where Gods began to be?

Or see the grand beginning, where space did not extend?
Or view the last creation, where Gods and matter end?

Methinks the spirit whispers, No man has found pure space,
Nor seen the outside curtains, where nothing has a place.

There is another thought that, while not strictly of an astronomical character, I would like to express in this connection. It is this: Five-sevenths of the earth's surface is covered with water and the remaining two-sevenths is land. It has been conclusively determined by sea soundings, that were the land leveled to an equal distance from the center of the earth, the water would cover it to a depth of nearly a mile, just as it must have been on the second day of creation. The Lord gave command on that day for the "waters to be gathered together and for the land to be made to appear."

After the land had been made to appear, and it had become fitted for the production of vegetable life, the Lord said, "Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind." (Gen. 1:11.)

Having thus been provided with sustenance, the animals in endless variety were next created, and, finally, man "was formed out of the dust of the earth," and given dominion.

Logan, Utah

*The distance to the sun and stars is determined by different methods, but the simplest of them all, to the mathematician, is that of triangulation in which the base line employed is the semi-diameter of the earth's orbit which is approximately twice the mean distance to the sun. This base line is obtained by taking observations six months apart, or when the earth is at the extreme ends of its orbit's opposite elongations.

A light year is the distance that light, traveling at the rate of 186,000 miles per second, will travel in a year—almost a million million miles—W.