Beyond St. Thomas Aquinas: Creation and Evolution

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ABSTRACT

What is life? A simple question but a complex answer. Science and religion have been in opposition since the early days as to which theory is correct. Do men come from monkeys? A single celled organism? Outer space? Or is it really God that willed men's existence. There were several scientific theories that explains the creation of the first living organism, spontaneous generation theory, primordial soup theory, panspermia theory, RNA world theory, and theory of evolution are some while there was only the theory of creation as written in the book of Genesis that Christians believes in. However, the conflicting theories have already garnered a long-lasting debate as to which is which. Fortunately, St. Thomas Aquinas, or as hailed as "The Great Synthesizer" have reconciled these conflicts through equal consideration of the both sides. He argued that creation can only be done by God however creation accounts only for the existence of things, not for changes in things. He said that we should hold on to the truth of the Bible without wavering. Since the Scripture can be explained in a multiplicity of senses, one should adhere to a particular explanation. But human ideologies alone should not be used as the basis of the credibility of the God's written word. Discoveries of science should be used as guideposts toward the proper understanding of Scripture's meaning not as a tool to abandon its truth. When science fails to explain, faith put it in plain.

Keywords: St. Thomas Aquinas, Summa Theologiae, Creation and Evolution

INTRODUCTION

What is life? This is a very basic question but at the same time a very complex one that after pondering onto, multitude of other questions will follow. When does life begins? Is life eternal? If it's not then when does it end? What is the purpose of life? What is the first life created? How does it come into being? There are a lot of disciplines which argues on these queries, but the two major disciplines are science and religion.

For science, different theories about life has been formulated over the past centuries and are still being studied by a lot of scientist to provide more accurate and scientific explanation about life. One of the first theories that explained the origin of life which contradicted that of the church is that life started from the void called apeiron, through an indeterminate substance, a theory proposed by ancient Greek philosopher Anaximander of Miletus (Curd, 1998). He also suggested that humans are not the first life forms on earth and that the first ones are the fishes which over time transformed into man (Kahn, 1994). This theory influenced scientists on later generations.

For the religious standpoint, the creation of life is mainly based on the book of Genesis of the Old testament bible which states that God created everything including life from the single cell organisms to the complex human beings in the span of six days (Andersen, 1987). This is greatly different to the theories of science, with this the Church greatly disagreed with these ideas and forcedly contained these information from the masses, thus excommunicating a lot of ancient scientists like Hypatia, Roger Bacon, Cecco d' Ascoli, Giordano Bruno, and Lucilio Vanini, which are not only excommunicated but also died while under the arrest of the church some are even burned at the stake ("Scientists Executed by the Catholic Church", n.d.).

Nowadays, although there are almost no one being excommunicated by believing in scientific theories, the discourse between the scientific theories and religious teachings on how life started still continues. But for Saint Thomas Aquinas, a great philosopher and theologian, which was also hailed as "The Great Synthesizer", there is always truth to both the words of God and the ideas of men, thus his works focused on the intersection of science and religion in various areas (Hermoso, 2019).

This research aims to give light and present discourse on the topic of origin of life and evolution by presenting the conflicting theories and beliefs on both science and religion and using St. Thomas Aquinas syntheses based on his work Summa Theologica.

THEORIES ON THE ORIGIN OF LIFE

Spontaneous Generation Theory

In the 6th and 5th centuries BCE, the early Greek natural philosophers aimed to explain the material principles on things, through the rational unity of the external world and contradicting the theological explanations (Seyffert, 1894). One of these early philosophers was Anaximander of Miletus. He was the probably the first western philosopher to suggest that life came nonliving matter, he believed that all things originated from the apeiron or elemental nature of the universe and that the elemental opposites in this void created all the things in the world (Curd, 1998).

“Anaximander of Miletus considered that from warmed up water and earth emerged either fish or entirely fishlike animals. Inside these animals, men took form and embryos were held prisoners until puberty; only then, after these animals burst open, could men and women come out, now able to feed themselves.” (Censorinus, n.d.)

This pre-Socratic theory inspired another philosopher namely, Aristotle. Although Aristotle’s theory mainly tackles the biology of life in the form of sexual and asexual reproduction, a part of this theory also describes the spontaneous generation. He compared this as how plants can be generated by either through seed of plants and some other plants which are self-generated through formation of some elemental principle similar to a seed as such some animals also spring from their parents and some others grow spontaneously and not from living matter. He further gave examples like several insects arises from the putrefaction of earth or vegetable matter while others spontaneously generated in the inside of animals out of the secretions of their several organs (Aristotle, 1910).

Thus, the spontaneous generation theory was fully established and this states that living creatures could arise from nonliving matter (Ball, 2016). However, this was challenged by several scientist during the start of the scientific revolution. The first to challenge were Francesco Redi and Lazzaro Spallanzani, during the 17th and 18th century. In Redi’s experiment he observed whether living organism (flies and maggots) will arise from a piece of meat in three different setups, which are sealed, open, and partially covered containers (Levine & Evers, 1999). The result showed that there were maggots on the meat in the open container and no maggots on the sealed container, interestingly maggots appeared on the cloth used in the partially covered containers (Redi, 1909).

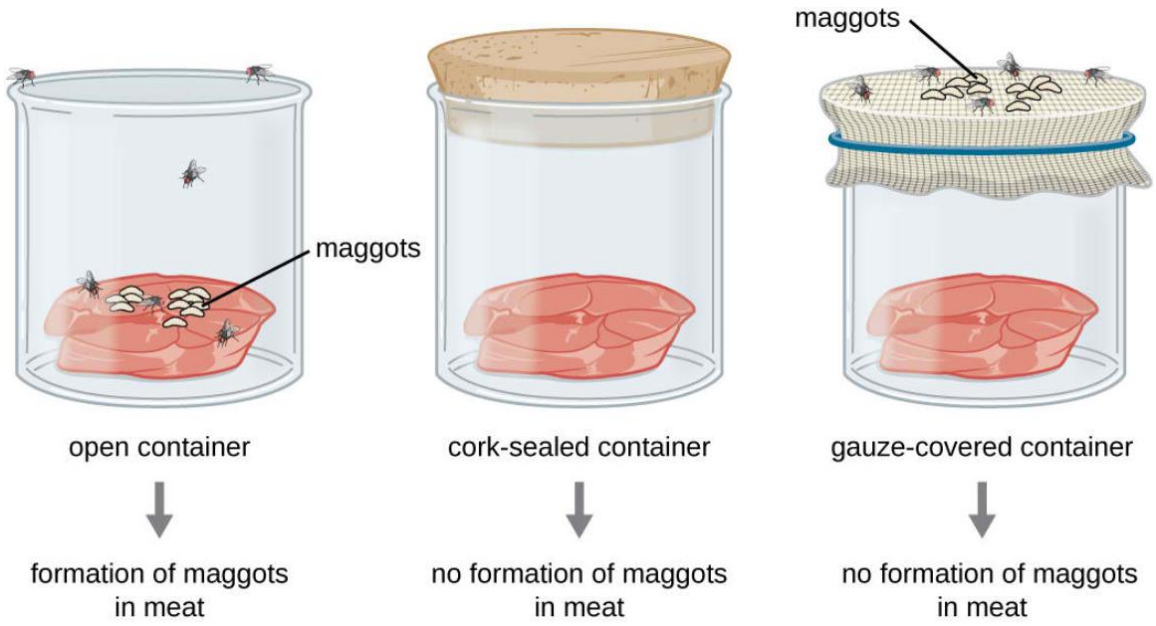

Figure 1. Illustration of Francesco Redi's experiment. Retrieved from http://www.pasteurbrewing.com.

Additionally, Louis Pasteur and John Tyndall experiments in the mid-19th century provided more scientifically accurate results thus finally disproving the spontaneous generation theory. In Pasteur's experiment, he heated a meat broth in a flask that had a long neck that curved downward, now called goose-neck flask, this was to prevent falling particles from reaching the broth, while still allowing the free flow of air. After days of incubation the broth remained clean meaning free from growth of microorganisms however when the flask was tilted to allow the broth to touch the particles at the end of the goose-neck flask, the broth became cloudy after sometime meaning there were growth of microorganisms (Engelhardt & Caplan, 1987; Levine & Evers, 1999).

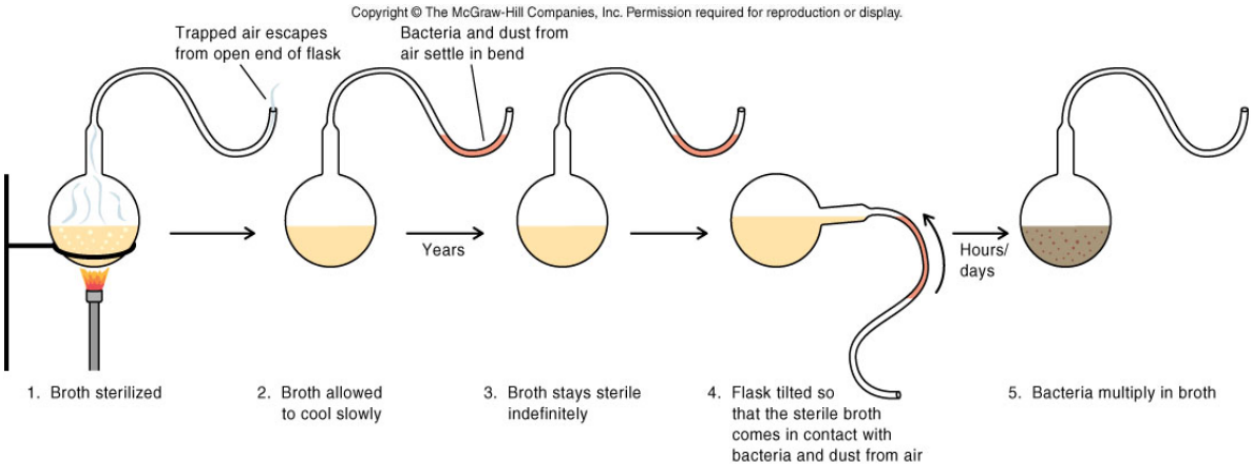

Figure 2. Illustration of Louis Pasteur's experiment. Retrieved from The MacGraw-Hill Co.

Primordial Soup Theory

During the early 20th century Russian biochemist Alexander Oparin and British-Indian scientist John Burdon Haldane proposed the heterotrophic theory which states that primitive Earth had a reducing atmosphere with abundance of methane (CH_3), ammonia (NH_3), free hydrogen (H_2), and water vapor (H_2O) which reacted to abiotic synthesis events overtime, this resulted in the formation of the prebiotic broth or primordial soup containing a wide variety of organic molecules that made life possible, which is why this theory is also known as primordial soup theory (Oparin, 1967).

This hypothesis was further supported by the findings of the experiment done by Stanley Miller and his assistant Harold Urey in 1952. The experiment simulated the hypothesis by evaporating methane (CH_3), ammonia (NH_3), water (H_2O), and hydrogen gas (H_2) in a flask running the resulting gas over continuous electrical spark brought by charged electrodes, this is to simulate lightning, and then the resulting atmosphere is cooled and condensed. In the results Miller was able to identify 5 amino acids: glycine, α-alanine, β-alanine, aspartic acid, and α-aminobutyric acid.

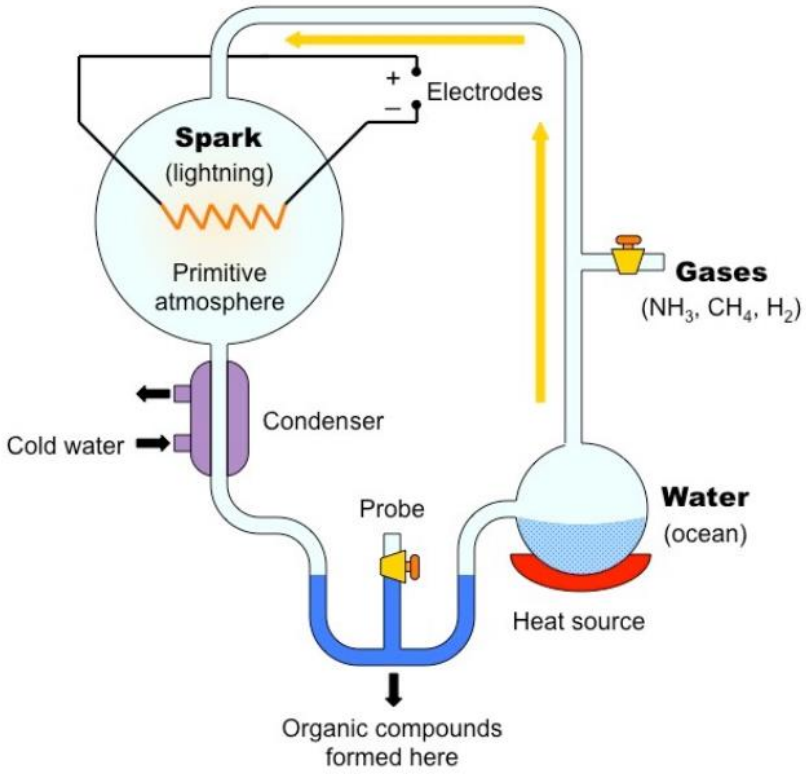

Figure 3. Illustration of Miller-Urey experiment. Retrieved from http://ib.bioninja.com.au.

Panspermia Theory

The panspermia hypothesis suggests that microscopic living organisms that can survive the harsh environment of the outer space such as extremophiles may have become trapped in space debris which may collide into planets via meteoroids, asteroids, comets, planetoid, and also by spacecraft carrying unintended contamination by these microorganisms (Rampelotto, 2010; Wickramasinghe, 2011; Webster, 2013; Madhusoodanan, 2014; Chan et al, 2018)

Pseudo-panspermia on the other hand argues that the pre-biotic organic building-blocks of life originated in space, these life essential components became incorporated in the solar nebula from which planets condensed over a period of time, and were further distributed to planetary surfaces where life then emerged (Klyce, 2001).

RNA World Theory

This theory was first proposed by Alexander Rich an American biophysicist and the term “RNA World” was coined by Walter Gilbert an American biochemist. This theory suggests that in the in the primordial Earth self-replicating Ribonucleic acid (RNA) formed in some primordial soup which may have been caused by hydrothermal vents, volcanic explosions, asteroid collision, and other abiotic synthesis events these self-replicating RNA over time evolved to more complex systems which are more efficient in their processes like proteins and DNA which then gave way to the evolution of the first living cell (Cech, 2012; Neveu et al, 2013)

For a living organism two of the most important requirement is to have something to store the genetic code and to have something to process this genetic information, in the modern model of a perfect cell Deoxyribonucleic acid (DNA) serves as genetic information storage while proteins processes these. According to this theory self-replicating RNAs were most likely the first organism to proliferate since they can both store and replicate genetic information (Zimmer, 2014).

Theory of Evolution

This theory was suggested by an English naturalist Charles Robert Darwin. The basic idea behind Darwin's Theory of Evolution is that all life is related and has descended from a common ancestor. Different species have evolved from simple life forms that first developed more than 3 billion years ago. These simple life forms species evolve into complex creatures purely naturally

over time. Evolution happens as random genetic mutations occur within an organism's genetic code. The beneficial mutations are preserved because they aid survival. These beneficial mutations are passed on to the next generation. Over time, beneficial mutations accumulate and the result is an entirely different organism. The process was called the Natural Selection.

Natural selection acts to preserve and accumulate minor advantageous genetic mutations. It also preserves a functional advantage that enables a species to compete better on different types of environment and eliminates inferior species gradually over time. Suppose a member of a species developed a functional advantage such as growing wings and learning to fly, its offspring would inherit that advantage and pass it on to their offspring. The inferior members, those who did not grew wings, of the same species would gradually die out, leaving only the superior members of the species.

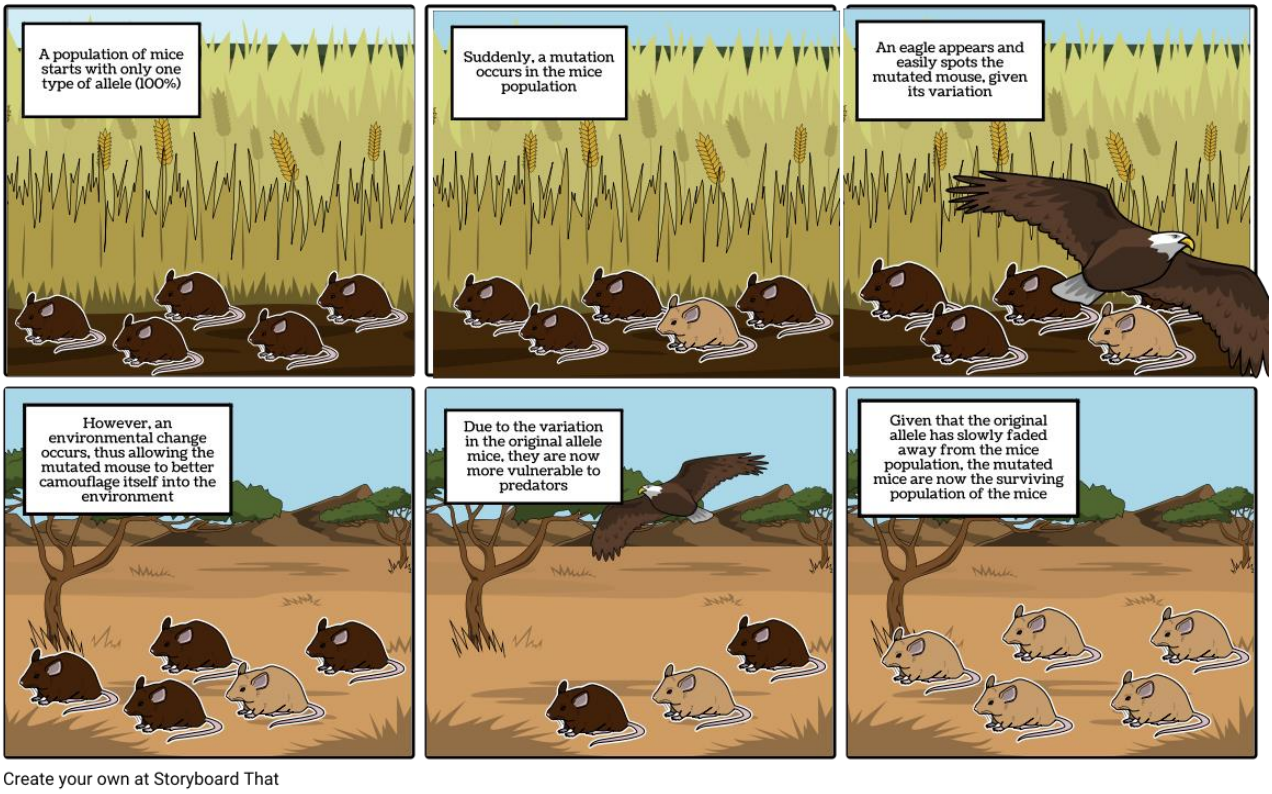

Figure 4. Schematic of black mice vs. tan mice for Natural Selection. Retrieved from https://www.storyboardthat.com/storyboards/rachelmccray/mice-population--natural-selection.

Darwin's natural selection is a slow gradual process. It acts only by taking advantage of slight successive variations that can never take a great and sudden leap, but must advance by short and sure, though slow steps. Thus, Darwin conceded that, "If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive,

slight modifications, my theory would absolutely break down." Such a complex organ would be known as an "irreducibly complex system". An irreducibly complex system is one composed of multiple parts, all of which are necessary for the system to function. If even one part is missing, the entire system will fail to function. Every individual part is integral. Thus, such a system could not have evolved slowly, piece by piece.

Similarly, we can observe rapid evolution going on around us all the time. Over the past 50 years, we've observed squirrels evolve new breeding times in response to climate change, a fish species evolve resistance to toxins dumped into the Hudson River, and a host of microbes evolve resistance to new drugs we've developed. Many different factors can foster rapid evolution — small population size, short generation time, big shifts in environmental conditions — and the evidence makes it clear that this has happened many times. And since humans often cause major changes in the environment, we are frequently the instigators of evolution in other organisms.

Darwin's Theory of Evolution is a theory in crisis in light of the tremendous advances we've made in biochemistry, molecular biology, and genetics over the past fifty years. The biochemistry of all living things on Earth is incredibly similar, showing that all of Earth’s organisms share a common ancestry. Molecular biologists have compared gene sequences among species, revealing similarities among even very different organisms. We now know that there are in fact tens of thousands of irreducibly complex systems on the cellular level. Specified complexity pervades the microscopic biological world. We don't need a microscope to observe irreducible complexity. The eye, the ear and the heart are all examples of irreducible complexity, though they were not recognized as such in Darwin's day. Nevertheless, Darwin confessed, "To suppose that the eye with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I freely confess, absurd in the highest degree."

Theory of Creation, Genesis

Creation theory is based from Genesis, the first book of the Bible. It started with the phrase “In the beginning.” It is said that God created the heavens and the earth. The earth was formless and empty and there was darkness all over the surface of the deep. When God said “let there be light”, it appeared in an instant. He separated it from darkness and called the light “day” and the darkness “night”. This is the first day.

On the second day, God created the sky while on the third day, He created the land and the sea. By His word, the land produced seed-bearing plants and trees according to their various kinds. The sun, stars and other heavenly bodies were created on the fourth day. On the fifth day, the seas and the sky were filled with creatures according to its kind. On the sixth day, God created land creatures, livestock, creatures that move along the ground and wild animals, each according to its kind. Then finally, God created man in his own image.

In Genesis 2, it was said that the heavens and the earth were completed in all their vast array. According to the Good News Translation (GNT), the whole universe was completed. By the seventh day, God has finished the work he had been doing. He rested from all the work he had done in creating the world.

Did God really take six days? Reading the first chapter of Genesis at face value will tell us that God created the universe, the heavenly bodies, plants, animals and humans in six ordinary days. Most church fathers accepted such statement but many of them had been influenced by Greek philosophy making them interpret the days as allegorical. They relate days to God's activities and since God is not bound with time, "days" could not be related to human time.

Speculations on the Theory of Creation

Due to the ambiguity of the terms used in the bible multitude of questions arose. Did God really take six days? Reading the first chapter of Genesis at face value will tell us that God created the universe, the heavenly bodies, plants, animals and humans in six ordinary days. Most church fathers accepted such statement but many of them had been influenced by Greek philosophy making them interpret the days as allegorical. They relate days to God's activities and since God is not bound with time, "days" could not be related to human time.

The Hebrew word for "day" is *yom*. A classical, well respected Hebrew-English lexicon has seven headings and many subheadings for the meaning of *yom* but defines the creation days of Genesis 1 as ordinary days under the heading "day" as defined by evening and morning. Outside Genesis 1, *yom* is used 410 times and it means an ordinary day. Exodus 20:11 says that God made the heavens and the earth in six days. This unambiguously refers to six earth-rotation days. Hebrew words *olam* and *qedem* are used to pertain long periods of time or indefinite time but these are not used in Genesis 1.

According to the abiogenesis theory, sun's energy gave rise to life. If this was so, why was that the plants were created first before the sun and other heavenly bodies? If the stated "days" in Genesis means thousand or even billions of years, it must be said that life can be generated even without energy. This is in contrast with the principle of chemistry which states that reaction will occur when enough energy of activation is achieved.

Second Peter 3:8 says that, "With the Lord, a day is like a thousand years, and a thousand years are like a day", but this has different context with the creation. On the other hand, Genesis stated that God created various kinds of living things, thus, do not stand on the theory of evolution. Evolutionists believe that everything evolved from a single celled organism that comes from non-living matter. But in the theory of creation, God created plants, animals, and human beings without undergoing transformation.

Stand of the Catholic Church

Of the speculations about the creation theory of the bible, the most intriguing question is whether to take the word "day" literally that God created everything with 6 twenty-four-hour days or assess the meaning allegorically. According to the article about the interpretation of Genesis 1 by the fathers of the church written by Rev. John Baptist Ku, O.P. (n.d), fathers of the church have different interpretations about Genesis 1. For instance, Ss. Basil the Great, Ambrose of Milan, and John Damascene all referred "day" in Genesis as twenty-four-hour periods.

Several ancient Doctors of the Church also claims that "day" in Genesis should not be taken literally. According to Ss. Justin Martyr and Irenaeus of Lyons as quoted in Psalm 90:4 the day in the Lords word is a thousand years and St. Cyprian writes that "The first seven days in the divine arrangement contain seven thousand years".

St. Clement of Alexandria and Origen also believes on the same sentiment that "six days" in Genesis should be taken allegorically. They argued that creation could not have taken place in time because time itself was created and as such you cannot have a day without a sun, a moon, and a sky.

On the other hand, St Augustine of Hippo did not interpret the six days of creation as six periods measured in hours but rather different orders of preliminary events which led to the main

event of creation all of which should not have happened in a passage of time but rather instantaneous, disagreeing with St. Clement's idea.

ST. THOMAS ON THE CREATION AND EVOLUTION

St. Thomas was hailed as The Great Synthesizer because he was able to write several discourses on several issues that intersected science and religion. According to Rev. John Baptist Ku, O.P. (n.d), in St. Thomas' readings of Genesis 1 although he distinguished three phases in the six days of creation, he did not choose his stand whether the "days" in Genesis are twenty-four-hour periods or symbols of different orders of creatures.

St. Thomas however observed the distinction between two events that may be the root of opposition between science and religion, that is, the difference between creation and change. For St. Thomas creation is the act of making things exist where before nothing existed while change is formation of new things out of preexisting basic elements. Coincidentally for evolution, the word Thomas uses for "change" is *mutatio*: He repeatedly reminds his readers that *creatio non est mutatio*—that is, creation is not change, alteration, development, or mutation. He also pointed out that the act of creation requires omnipotence and that the act itself is indivisible, meaning it is outside the confines of time.

On the speculation about "day" in Genesis, St. Thomas did not take a position on the matter, because neither conclusion can be proven, and the point is not theologically decisive. Rather on his prologue to q. 65 in the Summa Theologiae, he distinguished three phases: (1) the work of creation, as given in the words, "In the beginning God created heaven and earth"; (2) the work of distinction as given in the words, "He divided the light from the darkness, and the waters that are above the firmament from the waters that are under the firmament"; and (3) the work of adornment, expressed thus, "Let there be lights in the firmament." In summary St. Thomas stand on the issue is that the idea of creation over a period of time must be ruled out. Although it is acceptable, the evidence that there was development within six days is contradicting since it was already established that the act of creation is indivisible.

> *"According to Augustine, the work of creation pertains to the production of unformed matter and of unformed spiritual nature, both of which are outside of time, as he says in book 12 of the Confessions. Therefore, the creation of either is placed before any "day." But according to some Fathers, it can be said that the work of distinction and adornment is applied according to some change in creatures, which is measured by time. But the*

work of creation consists in the divine action alone in the instant of producing the substance of things. And therefore, any work of distinction and adornment is said to be done "in a day," but creation is said to be done "in the beginning," which bespeaks something indivisible"

Since it was now established that creation possibly happened instantaneously, how about the scientific findings of new types of organisms? St. Thomas thinks that God's single act in eternity can manifest itself in multiple, different ways in time. He believed that God created the world in six ordinary Earth days. Moreover, he thought that species have remained unchanged since their creation. In his theological synthesis, the *Commentary on the Sentences of Peter Lombard,* St. Thomas notes that the view that the world developed over six ordinary days "*is the more common position and seems more consonant with the letter on a superficial level*."

He responded to the question of whether all six days of creation are actually a description of a single day, a theory St. Augustine had suggested. St Thomas argues in favor of the view that God created all things to have potential:

"On the day on which God created the heaven and the earth, He created also every plant of the field, not, indeed, actually, but "before it sprung up in the earth" that is, potentially.... All things were not distinguished and adorned together, not from a want of power on God's part, as requiring time in which to work, but that due order might be observed in the instituting of the world (ST 74)."

He thinks that St. Augustine's view of the six days as signifying different orders of creatures but not different periods in time "*is more rational and better defends sacred scripture against the mockery of unbelievers."*

ST. THOMAS' RESOLUTION TO CONFLICTS OF SCIENCE AND FAITH

For Aquinas, there is no conflict between the doctrine of creation and any physical theory. Theories in the natural science accounts for change. Creation accounts for the existence of things, not for the changes in things. An evolving universe is still created universe. No explanation of evolutionary change, no matter how radically random or contingent it claims to be. When some thinkers deny creation on the basis of evolution, or reject evolution in defense of creation, they misunderstand creation or evolution or both.

According to Summa Theologica (ST I.68.1), "*The first is, to hold the truth of Scripture without wavering. The second is that since Holy Scripture can be explained in a multiplicity of senses, one should adhere to a particular explanation, only in such measure as to be ready to abandon it, if it be proved with certainty to be false; lest Holy Scripture be exposed to the ridicule of unbelievers, and obstacles be placed to their believing".*

From his Commentary on the Sentences, he told his readers on how to treat conflicting interpretations in the Scripture:

> *"Concerning the beginning of the world, there is something that pertains to the substance of faith, namely, that the created world had a beginning, and all the Fathers agree on this. But how it begun and in what order it was made pertains to faith only accidentally, insofar as these opinions are handed on in Scripture, whose truth the Fathers, holding diverse opinions, handed on by diverse explanations".*

CONCLUSION

St. Thomas distinguishes the three phases of the six-day creation: the work of creation, the work of distinction and the work of adornment. God created the universe out of nothing through the work of creation but the changes that occur to the creatures are part of the work of distinction and adornment. This idea supports the principle that God alone is the creator, the ultimate cause of everything. However, creation accounts only for the existence of things, not for changes in things. This explains the possibility that evolution does not contradict to what is written in the Scripture.

It is therefore concluded that St. Thomas had really different view on the origin of life. His intellectual traditions are grounded in the philosophical and theological synthesis. It enables him to combine the conflicting ideas of science and faith. But for the sake of avoiding conflicts, there is a possibility that the Scripture is being compromised. He said that we should hold on to the truth of the Bible without wavering. Since the Scripture can be explained in a multiplicity of senses, one should adhere to a particular explanation. But human ideologies alone should not be used as the basis of the credibility of the God's written word. Discoveries of science should be used as guideposts toward the proper understanding of Scripture's meaning not as a tool to abandon its truth. When science fails to explain, faith put it in plain.

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