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Redeeming Science Teaching from a Biblical Perspective – Teaching Evolutionary Studies to Grade 7 in Indonesian Christian Schools

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Background

This thesis is built upon the perspective now well accepted in educational philosophy, that scholarship is not and cannot be, philosophically neutral (Bartholomew, 1997; Bratt, 1998; Clouser, 2005; Dooyeweerd, 1966; Edlin, 1999; Geisler, 1999). Scholarly investigations, and their classroom out workings, always reflect the presuppositions of those involved in the development and delivery process. As Bartholomew (2000, p. 12) contends, “To claim to be free of philosophical presuppositions is simply to be unaware of them.”

Some educators in the secular community are comfortable with the prevailing worldview of modernism that exists in many science textbooks and in science instruction in schools. However, this paradigm has come under threat in recent years from two main directions. First, the disenchantment with scientism as a credible omnipotent belief structure that began to occur in the twentieth century. Though still the default position in a number of textbooks, this logical positivism approach has been replaced in some academic circles by an equally strong philosophical force—that of postmodernism.

Second, for educators and parents committed to a reformational perspective that celebrates the Lordship of Jesus Christ over all of creation and which seeks to apply a Christian worldview framework to all of life, neither of the two schemes of modernism or postmodernism above are acceptable. Christians who are concerned about the nature and content of teaching in science classrooms choose to frame science teaching and learning within a robust and credible, biblically authentic reformational context and develop strategies and resources for Christian school teachers to reflect this worldview.

The purpose of this thesis is to explore the religious nature of science teaching, critique contemporary paradigms, and identify science classroom patterns that will reflect a Christian worldview in the specific context of the theory of evolution by Charles Darwin.

Problem Statement

The main problem people have when they think about science is that they believe there is religious neutrality. They think that concepts in science such as evolutionary theory are neutral to any religious beliefs. Therefore, people may easily accept the misconception that science contains facts and contains nothing with regard to beliefs or religions. Some other people may have a concept that science and religion are in conflict indeed (Draper, 1874; White, 1876).

However, thoughtful Christians will see this case differently. On one hand, religious neutrality is a myth (Edlin, 1999). On the other hand, science and religion are not in conflict. For example, inventions by many devoted Christians support the contention of this paper that Christianity is not an anti-science religion. Johannes Kepler (1571–1630) once said, “I had the intention of becoming a theologian ... but now I see how God is, by my endeavors, also glorified in astronomy, for ‘the heavens declare the glory of God’” (Eadshome, 2007). The famous Sir Isaac Newton (1642–1727) asserted, “There are more sure marks of authenticity in the Bible than in any profane history” (Eadshome, 2007). Louis Pasteur (1822–1895) who was a contemporary of Charles Darwin and the father of microbiology said similarly that there is a close relationship between science and Christianity: “The more I study nature, the more I stand amazed at the work of the Creator, science brings men nearer to God” (Eadshome, 2007). In short, Christians believe that any of our worldviews will drive how we see nature and the world around us through the lens of science or of other subjects.

Another problem that may occur in a pluralistic country like Indonesia and specifically in Christian schools is that there may be an intrusion into official curricula and textbooks from other religious beliefs trying to use science as a base to assert their beliefs to students.

The following questions arise in light of these tensions:

- How should Christian parents and educators in Indonesia respond to unbiblical science curricula such as evolutionary theory?
- What is a Biblical perspective on science teaching as an alternative to evolutionary teaching?

Purpose of the Study

The general purpose of the study is to critique evolutionary theory and its impact in the classrooms from a Christian worldview perspective.

Specific purposes of the study are to:

- expose the intrusion of evolutionary theory into the teaching curriculum of an Indonesian Christian School.
- redeem (buy back) science teaching to a Biblical perspective.
- review evolutionary studies in Christian Schools in year 7 in Indonesia.

Scope of the Study

The research will cover the philosophical area, and the debates that have occurred, between science and religion in general in recent decades. It will discuss the history of evolutionary thought, before and since Darwin. It will describe the structure of science curricula in Indonesia, and then how Christians in Indonesia should see this opportunity and integrate it in term of God's Word and world. The research will focus on the evolutionary theory, which is a controversial topic. It is also of interest to many adolescents because of the topic of the origin of life. Moreover, this study will address the question of why grade 7 adolescents should learn this topic. This thesis also will provide some guidelines of how to present evolutionary theory to grade 7 students of Christian schools in Indonesia.

Research Methodology

The research will be based on the historical-philosophical method. This will be done by reading a wide range of text books, published and unpublished articles, charts, diagrams, and other documents related to the topic of study, with an analytical and inquisitive approach of the historical development of the subject of study. Analytical means that this thesis will investigate each discussion thoroughly. Inquisitive means it will develop towards suggesting a new paradigm option.

Definition of Terms

Biblical perspective: point of view about anything from the Bible.

Creation: the origin or beginnings of things (Geisler, 2005).

Evolution: A theory popularized by Charles Darwin in 1859 who tried to explain the origin of species by means of natural selection. Before Darwin, there was a long history of this idea back to the Greeks when they had been trying to answer how life begins.

Intelligent design: a theory that certain features of the universe and of living things are best explained by an intelligent cause, not an undirected process such as natural selection (Discovery Institute, n.d.). The theory that matter, the various forms of life, and the world were created by a designing intelligence (Merriam-Webster, 2010).

Natural selection: survival of the fittest. It is Charles Darwin's theory which explains the preservation of favorable individual differences and variations, and the destruction of those which are injurious (Darwin, 1872).

Pluralism: the belief that the existence of different belief structures of people within the same society is a good thing (Cambridge Advanced Learner's Dictionary, 2010).

Science: the systematic study of the structure and behaviour of the physical world, especially by watching, measuring and conducting experiments, and the development of theories to describe the results of these activities (Cambridge Advanced Learner's Dictionary, 2010). Science is a human comprehension of how God, the Creator created the world, and takes care of it by His word of power (Susanto, 2011). Since it deals with God's creatures and relation among those, this subject can be divided to two areas: Natural Science and Social Science. Natural science can be divided into: Astronomy, Biology, Chemistry, Ecology, Geology, and Physics. Social science can be divided into: Anthropology, Economics, Linguistics, Political science, Psychology, and Sociology.

Theory: a well-substantiated explanation of some aspect of the natural world; an organized system of accepted knowledge that applies in a variety of circumstances to explain a specific set of phenomena; a tentative insight into the natural world; a concept that is not yet verified but that if true would explain certain facts or phenomena; a belief that can guide behavior (Lewis, 2010).

Worldview: a way of seeing and being in the world (Edlin, 2009).

Meaning of Evolution and Evolutionism

Evolution

The word evolution is usually acknowledged as referring to Charles Darwin's writing, because he explored the idea of the development of life from the simple form to the more complex, which is so controversial even today. Interestingly, in the first edition of his famous book from

1859, *On the Origin of Species*, Darwin never used this word. Not until the sixth edition of his book, which is often considered as the definitive edition did he mention the word evolution, referring to the gradual development of life.

There are two meanings of the word evolution: 1) “A process in which something passes by degrees to a different stage (especially a more advanced or mature stage)”, and 2) “(Biology) the sequence of events involved in the evolutionary development of a species or taxonomic group of organisms” (Lewis, 2010). It is clear that over time, the word evolution itself evolved to take a new meaning. The shifting of the meaning of the word evolution is similar to the understanding of Pearcey & Thaxton, “Just as individuals move up through several stages of development, so all of life was presumed to move up the great chain of being from simpler forms to humanity” (1994, p. 98).

When we discuss the meanings of evolution, we follow the concepts outlined in *The Meanings of Evolution* by Meyer & Keas (2001). They identify six primary characteristics of evolution as follows:

1. Change Over Time. Nature has a history, it is not static. Natural sciences including Biology seek to reconstruct series of past events to tell the story of nature’s history.
2. Gene Frequency Change. Geneticists found that there are changes in the frequencies of alleles (alternative forms of the genes) in the gene pool of a population.
3. Limited common descent. The idea that particular groups of organisms have descended from a common ancestor.
4. The mechanisms responsible for the change required to produce limited descent with modification, chiefly natural selection acting on random variations or mutations.
5. Universal common descent. The idea that all organisms have descended from a single common ancestor.
6. “Blind watchmaker” thesis. The “blind watchmaker” thesis was coined by Richard Dawkins (1996). It states that all new living forms have descended from common ancestors solely through unguided, unintelligent, purposeless, material processes such as natural selection acting on random variations or mutations.

Evolutionism

Concerning the origin of species, Charles Darwin believed that species have been developing from a common ancestor by means of Natural Selection. His theory explained where all of the amazingly diverse kinds of living things came from and how they became delicately adapted to their particular environments. Darwin believed that Natural Selection has been selecting which species may continue or end their lives, and the species which survived through that selection

will have more descendants and survive, but the others will become extinct. Darwin (1859) added that “Natural Selection will always act very slowly, often only at long intervals of time, and generally on only a very few of the inhabitants of the same region at the same time” (p. 50). Because the idea of evolution by means of Natural Selection specifically refers to Charles Darwin, many historians of science have given it the term Darwinism. For the purposes of this thesis, we shall define Evolutionism or Darwinism is a belief that species have been developing from one species type to another by means of Natural Selection.

It should be added that despite the contemporary secular understanding of evolution, it has been suggested that Darwin later in life acknowledged the possibility of divine control over the evolutionary process (Ellegård, 1990).

Historical Sketch of Theory of Evolution by Charles Darwin

There were some scientists and their works which influenced Darwin strongly, such as traveler Alexander von Humboldt (Wyhe, 2011), astronomer Sir John Herschel, geologist Sir Charles Lyell (Wyhe, 2011; AllAboutGOD.com, 2011a; Leff, 2010, Henslow, para. 4; Leff, 2010, Herschel, para. 2; Leff, 2010, Lyell, para. 2), Thomas Malthus (AllAboutGOD.com, 2011b; Leff, 2010, Malthus, para. 2), Jean-Baptiste Lamarck, and Alfred Russel Wallace (Leff, 2010, Lamarck, para. 3; Leff, 2010, Wallace, para. 3-4). Darwin (1872) himself in the preface of his sixth edition acknowledged thirty-four authors who influenced him in developing the theory of evolution by means of Natural Selection.

According to Wyhe, Lyell’s new book, *Principles of Geology* (1830-3), greatly influenced Darwin especially when Darwin acquired that book from Captain Fitzroy, the Captain of Beagle: Lyell offered not just a new geology but a new way of understanding nature. Lyell showed how tiny, slow, gradual and cumulative change over immense periods of time could produce large changes. Natural, visible, non-miraculous causes should be sought to explain natural phenomenon. Darwin had the opportunity to witness all of these forces, such as erosion, earthquakes and volcanoes, during the Beagle voyage and he became convinced that Lyell’s views were correct. Darwin made several very important discoveries about the geology of South America, volcanic islands and the origins of coral reefs by building on Lyell’s ideas (2011, para. 7).

Darwin (1845) firmly described what he believed based on Lyell’s ideas in the 2nd edition of his *Journal of researches into the natural history and geology of the countries visited during the voyage of H.M.S. Beagle round the world, under the command of Capt. Fitz Roy, R.N.:* “Where on the face of the earth can we find a spot, on which close investigation will not

discover signs of that endless cycle of change, to which this earth has been, is, and will be subjected?" (p. 495).

In October 1838, Darwin read *Essay on the Principle of Population* by Thomas Malthus. Malthus argued that growth of population was geometrical and will outstrip the food production. The arguments in Malthus' essay inspired Darwin. He realized that a tremendous proportion of living things are always destroyed before they can reproduce, because they will be short of food for surviving. This must be accurate because every species would otherwise breed enough to fill the earth in a few hundred generations. In fact, populations remain nearly stable year after year. This can be understood only with the possibility that most progeny do not survive long enough to reproduce.

Wyhe (2011) concluded that Darwin believed that only the survivors would pass on their form and abilities. Their characteristics would persist and multiply whilst characteristics of those that did not live long enough to reproduce would decrease. Darwin did not know precisely how inheritance worked—at his time, genes and DNA were totally unknown. Nevertheless he appreciated the crucial fact of inheritance that offspring resemble their parents. From his observations and experiments with domesticated and wild plants and animals he could find no limits to the degree organic forms could vary and change through generations. Thus the existing species in the world were related not on a “chain of being” or separated into artificially separate species categories but were all related on a genealogical family tree through “descent with modification”. As Darwin wrote in the *Origin of Species* (1859):

Why should the species which are supposed to have been created in the Galapagos Archipelago, and nowhere else, bear so plain a stamp of affinity to those created in America? There is nothing in the conditions of life, in the geological nature of the islands, in their height or climate, or in the proportions in which the several classes are associated together, which resembles closely the conditions of the South American coast: in fact there is a considerable dissimilarity in all these respects. On the other hand, there is a considerable degree of resemblance in the volcanic nature of the soil, in climate, height, and size of the islands, between the Galapagos and Cape de Verde Archipelagos: but what an entire and absolute difference in their inhabitants! The inhabitants of the Cape de Verde Islands are related to those of Africa, like those of the Galapagos to America. I believe this grand fact can receive no sort of explanation on the ordinary view of independent creation; whereas on the view here maintained, it is obvious that the Galapagos Islands would be likely to receive colonists, whether by occasional means of transport or by formerly continuous land, from America; and the Cape de Verde Islands from Africa; and that such colonists would be liable to modification;—the principle of inheritance still betraying their original birthplace (pp. 398–399).

Darwin took approximately twenty years (Taylor, 1991) on the subject of natural selection to

convince himself and the scientific community that evolution was true before he published the *Origin* in 1859. The idea of evolution itself did not originate with Darwin as stated by Darwin in his *An Historical Sketch of the Progress of Opinion on the Origin of Species*. There were two publications several years before Darwin's *Origin* which showed the power of natural laws to control the development of nature and society (Wyhe, 2011). These were *Constitution of Man* (1828) by George Combe and the anonymous *Vestiges of the Natural History of Creation* (1844) which was later revealed to have been written by Robert Chambers. It seemed that Darwin refined his predecessors' ideas to be more accurate. However, many rejected Darwin's idea on natural selection as the primary mechanism of evolution.

Darwin's publication of *Origin* was shadowed by Alfred R. Wallace's work, who found the similar conclusion to what caused one species to diverge from another (Taylor, 1991). Darwin formulated his theory based on his researches in the Galapagos Islands, South America, and Wallace found the survival-of-the-fittest as the mechanism by which selection took place, through his researches in the Malayan jungle. It was Charles Lyell, his friend and mentor, who persuaded Darwin to immediately begin writing a book on everything that he had discovered so far to avoid Wallace publishing first. However, many historians acknowledge that Wallace and Darwin were the co-discoverers of natural selection or survival-of-the-fittest (Flannery, 2010).

Evolutionary Concepts before Darwin

The success of Darwin's *Origin* in which he proposed the theory of evolution, was extraordinary. In 17 years it sold 16,000 copies, a remarkable achievement in that day (Rusch, 1959). However, no matter how much Darwin may have contributed, he did not originate the theory of evolution. Rusch (1959) believed that the concept of evolution had its beginnings about 700 B. C. in Ionia, Greece. In chronological order, the people who contributed to the theory of evolution are as follows:

- Thales of Miletus (640–546 B. C.)
- Empedocles of Agrigentum (495–435 B. C.)
- Aristotle (384–322 B. C.) thought that a purposeful force created a primordial mass of living matter from which all the forms of life from the simplest plants to the most complex animals evolved. Aristotle was believed to be the father of modern science and a man who influenced the world immensely (Blakesley, 1839).
- Epicurus (341–270 B. C.)
- Lucretius (99–55 B. C.)
- Saint Augustine (A. D. 354–430) was one of the early church fathers. He speculated that the seven days of the creation week were not days as we know them. In other words, he favored an allegorical interpretation of the book of Genesis (Davidheiser, 1969). However, when we read

his works carefully, we may not conclude that he is a contributor to the development of evolutionary thought (Rusch, 1959).

- Thomas Aquinas (1225–74) was also listed as contributing to evolutionary thought even though there is indication that he was simply reporting on various opinions in these respects held by Saint Augustine and other theologians of earlier days (Rusch, 1959).

- Carl Linnaeus (1707–78) was a Swedish biologist who was known as the father of taxonomy. Rusch (1959) found that Linnaeus was the one who identified Scriptural “kind” with “species” and held that each species of animals and plants was created as a single adult pair. Later he seemed to have abandoned it and considered “kind” as genera, not species. In general, he regarded species as the units of creation, and he recognized purposeful design and designer (Taylor, 1991). However, Linnaeus introduced the system of plant classification and gave “no hint that one species related to another through some ancestral form” (Taylor, 1991, p. 41).

- Comte de Buffon (1707–88) was a French naturalist who believed that there has been a form change from one animal type to another (Rusch, 1959). Buffon sowed the seeds of the idea of evolution through the great work of the *Histoire Naturelle* which later became the main points of Darwin’s *Origin* (Taylor, 1991).

- Erasmus Darwin (1731–1802) was the grandfather of Charles Darwin. He produced a two-volume work entitled *Zoonomia*. In the preface he stated, “The great CREATOR of all things has infinitely diversified the works of his hands, but has at the same time stamped a certain similitude on the features of nature, that demonstrates to us, that the whole is one family of one parent” (Darwin, 1794, p. 1). He used the term ‘evolution’ to explain about the change from one parent to become one family of nature.

- Chevalier de Lamarck (1744–1829), a French zoologist, concluded that evolution is a general process embracing every form of life in a single historical process which he saw as a tree of life or phylogeny (Rusch, 1959). Lamarck believed that frequent and constant use of any organ gradually strengthens, develops, and enlarges it. On the other, lack of use such an organ gradually weakens it, causes it to become reduced in size and function and ultimately to disappear (The law of use and disuse). Charles Darwin (1872) acknowledged that Lamarck was the first person who drew significant conclusions on this subject and attracted much attention for his conclusion that all species, including man, are descended from other species.

- Thomas Malthus (A. D. 1766–1834) was an English clergyman who published the first edition of *An Essay on the Principle of Population* in 1798. Malthus (1798) pointed out that “the power of population is indefinitely greater than the power in the earth to produce subsistence for man” (p. 4). Malthus writing was read by Darwin and affected his thinking (Darwin, 1859).

- Robert Chambers (1802–71) was a noted Scottish author and publisher. He was the one who brought evolution seriously “to the attention of the general public from a scientific point of view in 1844” (Davidheiser, 1969, p. 51). His work of *The Vestiges of the Natural History of Creation* was the only volume related to evolution between Lamarck’s *Philosophie Zoologique*

and Darwin's Origin (Osborn, 1924). He held that life increased in complexity as one traced through the layers of sedimentary rock and that a succession of living forms increasing in complexity were the elements of organic creation (Rusch, 1959).

SCIENCE CURRICULUM IN INDONESIA

Brief History of Indonesian Curriculum

The history of the Indonesian curriculum cannot be separated from the history of Indonesia as a Republic. Indonesia declared her independence from the Dutch on August 17th, 1945 after being colonized for almost three hundred fifty years by the Dutch and three and a half years by Japanese. Although the people of Indonesia experienced a horrible time under the Dutch colonial government, they had no dislike or hatred toward the Dutch. As Wangsalegawa (2009) says, "The Republic of Indonesia is open to and welcomes the influence of Western ideas, from both Europe and the United States. Western influence has brought tremendous change to the country, including to its education system (p. 1)." Schools were introduced by the Portuguese, and then the Dutch created the first formal education system from elementary to higher education during the years 1892 to 1920 (Wangsalegawa, 2009).

The Republic of Indonesia has changed her national education curriculum nine times since 1947, including 1952, 1964, 1968, 1975, 1984, 1994, 2004, and 2006. The frequency of curriculum alteration has been due to recurring development in the political system, social, cultural, economic, and science (Elvyanti, 2010). However, the educational philosophies of the country's curriculum have been heavily influenced by Western ideas (Wangsalegawa, 2009).

Structure of Science Curriculum (Elementary to High School)

The government of Indonesia through the Minister of National Education (Menteri Pendidikan Nasional—Mendiknas) divided the 2006 curriculum into five groups of subjects (2006, p. 346):

1. Religion and Noble Morality
2. Citizenship and Personality
3. Science and Technology
4. Aesthetics
5. Physical, Sport, and Health.

The Placement of Evolution in Contemporary Science Curriculum

The government of Indonesia enacted the subject of science as part of Integrated Curriculum, which is compulsory for students from grade 1 to 10 and grade 11 to 12 who choose Natural Science Program as their elective study. Following the research on materials of National Curriculum from grade 1 to 12, the study of the theory of evolution can be found in two wide-ranging categories: The subject of Natural Science and non subject of Natural Science. Details on the matter are represented in two tables below:

Table 1 Evolution in the National Curriculum Textbooks—Grade 1 to 12
(Subject of Natural Science)

Grade	Level	Subject	Chapter	Sub-Chapter
5	Elementary	Natural Science	Adaptation of Living Things (Tim Bina Karya Guru, 2008, pp. 61–71).	
11	Middle School	Natural Science—Biology	Survival Existence of Organism (Nurhayati, 2007, pp. 164–184).	<ul style="list-style-type: none"> ▪Adaptation ▪Natural Selection
12	High School	Biology	Theory of Evolution (Nurhayati, 2009, pp. 237–277).	

Table 2 Evolution in the National Curriculum Textbooks—Grade 1 to 12
(Non Subject of Natural Science)

Grade	Level	Subject	Chapter	Sub-Chapter
–	Elementary	–	–	–
7	Middle School	Social Studies—History	Prehistoric*) Human (Matroji, 2006, pp. 9–13).	–
11	High School	Geography	Biosphere and Aspects of Animal and Plant Distribution (Wardiyatmoko, 2007, pp. 1–22).	<ul style="list-style-type: none"> ▪Identification of Animal and Plant Distribution on Earth ▪Analysis of the distribution of animals and plants in Indonesia ▪Impairment of Animal and Plant and Impact on Life History

Note. *) Prehistory means the time during the development of human culture before the appearance of the written word (Lewis, 2010)

The Emergence of Diversity in Designing Science Curricula in Indonesia

The year 2004 marks an important point in the history of education in Indonesia which was also known as the initial year of Educational Reform in Indonesia. It was following what happened in Indonesia in 1998, when the Suharto regime collapsed. Suharto, as the second President of Indonesia, ruled dictatorially for thirty two years including the areas of education.

After the fall of the Suharto regime, Indonesia experienced “a dramatic change particularly in terms of the political system, as it moved from authoritarianism to democracy” (Raihani, 2007, p. 173). Another outcome was that the previous centralization policy was changed to a decentralization policy, including the areas of educational management and curriculum. Raihani (2007) asserted that this reformation of the educational system was known as the implementation of School-Based Management (SBM). This SBM was introduced to reduce a regrettable dominance of the central (Jakarta) authority over almost every aspect of schooling.

According to the Ministry of National Education (MNE), the 2004 curriculum put an emphasis on standardized competencies that the students were to achieve and on a greater authority for the school stakeholders to participate in the curriculum development. As a consequence, there are needs for the school stakeholders to advance their capabilities for designing their own curriculum in order to accomplish each student’s competence and for managing their school as well. Relating to science curriculum, the schools will perceive this shifting educational system as an opportunity for schools to plan their unique curriculum based on their capabilities.

A comparison between the 2004 curriculum and the previous one, provided by the MNE (2003), is summarized in Table 3 as follows (Raihani, 2007, p. 178):

Table 3 A Comparison of the 1994 and 2004 Curricula

Similarities	
a) 9 year compulsory learning	
b) emphasis on abilities of reading, writing, and arithmetical functions	
c) essential concepts and materials in each subject to achieve competencies	
d) local content curriculum	
e) 45 minutes allocated for each learning hour in every level of school	
Differences	
1994 Curriculum	2004 Curriculum
<ul style="list-style-type: none"> • centralist • contains no standardized competences • no activities to familiarize students to content and concepts • no ICT • multiple choice assessment • thematic approach for grades 1 & 2 students of 	<ul style="list-style-type: none"> • decentralist • contains standardized competences • integrated and programmed activities to make students familiar with content and concepts • introduction of ICT • classroom-based assessment • thematic approach for grades 1 & 2 students of

<p>elementary school (recommended only)</p> <ul style="list-style-type: none"> • no continuity of competencies • no curriculum diversification • syllabus developed by the local educational authority or school depending on needs 	<p>elementary school (compulsory)</p> <ul style="list-style-type: none"> • continuity of competencies stratification from grades 1 to 12 (over school levels) • curriculum diversification: special and international curricula • giving opportunities to teachers, schools, and local authorities for program elaboration and adaptation or analysis of material
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REDEEMING SCIENCE TEACHING

What is Science?

The term science was coined in the 14th century from the Latin word *scientia*, which simply means “knowledge” (Online Etymology Dictionary, 2011). From the formal point of view, Oxford Dictionary defines science as “the intellectual and practical activity encompassing the systematic study of the structure and behavior of the physical and natural world through observation and experiment” (Oxford University Press, 2011, para. 1).

From those two definitions we may set down the limitations or boundaries of science, because through science itself people cannot find comprehensive truth. People may not rely on science to explain all aspects of reality—this is reserved for God and Him alone. Weaver (1948) asserted “There are rich and essential parts of human life which are alogical, which are immaterial and non-quantitative in character, and which cannot be seen under the microscope, weighed with the balance, nor caught by the most sensitive microphone” (p. 10). Psalms 139:6 admits clearly this limitation of science and of our brain in contrast to omniscient God: “Such knowledge is too wonderful for me, too lofty for me to attain” (New International Version, 2011).

From Christian perspective, science means a human comprehension of how God, the Creator created the world and takes care of it by His word of power. From this definition we can divide science into two categories: 1) about the creatures which is called Natural Science and 2) the relation among the Creator and the creatures which is called Social Science. Natural science can be divided into: Astronomy, Biology, Chemistry, Ecology, Geology, and Physics. Social science can be divided into: Anthropology, Economics, Linguistics, Political science, Psychology, and Sociology.

There is no belief other than Christianity which is able to validate the sensory experiences and limitations of science. We may trace back to the book of Genesis to find the reason we should

learn about nature. In Genesis 1:28, God said to man, “Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground”. Moreover, God ordered Adam to name all the livestock, the birds in the sky and all the wild animals (Genesis 2:20). Then, it was no exaggeration when Kennedy & Newcombe (2001) articulated boldly “The Church has made more changes on earth for the good than any other movement or force in history” (p. 3). They conclude that modern science is dependent upon the incarnation.

Hoeksema (1966) pointed out that science which has a root meaning of “knowledge” must be referred back to what the Bible says. He prompted that true knowledge is always dependent upon knowledge of God. “... knowledge of the Holy One is understanding,” Proverbs 9:10 says. In other words, the understanding of everything has its true focus through our relationship with God as stated in the Bible. Jacob Bronowski asserted the importance of human understanding to master nature: “Man masters nature not by force but by understanding. This is why science has succeeded where magic failed: because it has looked for no spell to cast over nature” (1956, p. 18).

An examination of Loren and Deborah Haarsma’s point of view (2007) in their book *Origins*, about the relationship of nature and the Bible, is useful. They assert that God made two books which are Nature and Scripture. Both are not in conflict because they are God’s, but their derivatives which are Science and Theology have a potential conflict because both are human interpretations. This is described more clearly with Figure 1 below:

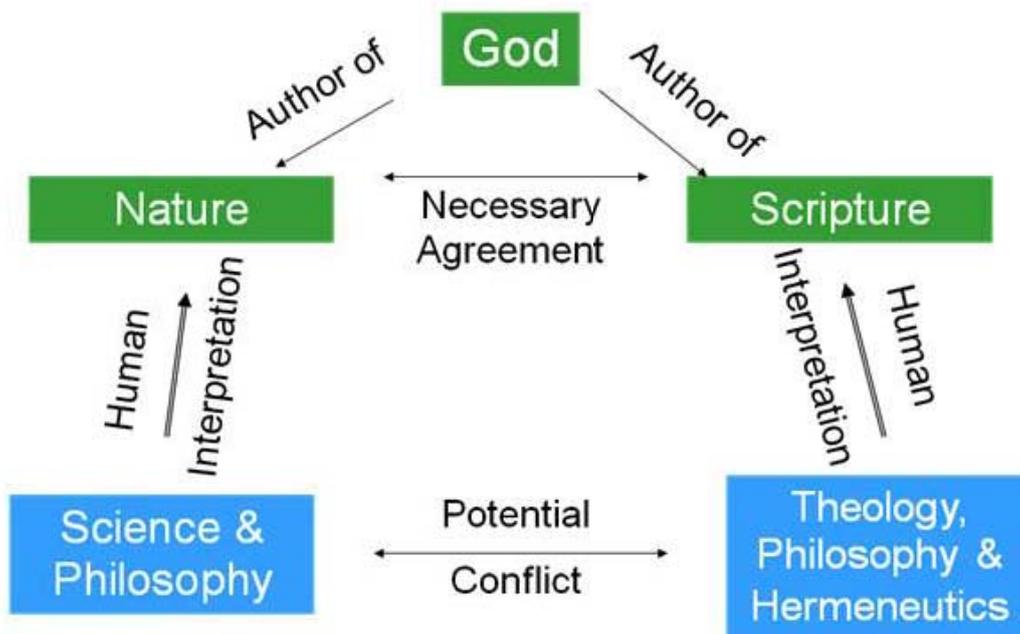


Figure 1. The “Two Books” metaphor: Nature & Scripture. Nature and Scripture which were written by God, have a necessary agreement. Instead, human interpretation of those may produce a potential conflict.

For the purpose of this thesis, we shall refine the idea of the “Two books” metaphor, because in their original model, we cannot see a relationship between science and Scripture, whereas Scripture should illuminate all of human knowledge. Their diagram infers that science as a human interpretation of nature may be alienated from the human interpretation of Scripture. Therefore, this thesis suggests a new model of relationship between science, as one of human knowledge, and the God of the Bible by Figure 2 that follows:



Figure 2. Relationship between God’s Work and Human Knowledge. Threefold of God’s work should illuminate human interpretations of the world. In other words, human knowledge should be based on God’s ideas and characters which he has revealed through the Bible.

Through this diagram we understand that God, as stated in the Bible, is the One who wrote the Scriptures, worked through Jesus Christ to obtain salvation, and worked in creation. God enlightens all of human knowledge from Theology to Language, including science. From this perspective, science as part of human knowledge should be used by humans to glorify God because a creature should function according to the Creator’s purpose which is to glorify Him.

The Myth of Religious Neutrality

The theory of evolution which has been embedded in Indonesian schools’ curriculum for many years was based on the assertion that Evolution is true and scientific facts are void of any religious beliefs. Many schools, including Christian schools, in Indonesia which are using texts supporting evolutionary theory appear to completely accept the theory’s validity. It is only a myth, though, that scientific facts can be void of religious beliefs. The theory of evolution must be seen within the time frame of its history, which showed that Darwin’s evolution was derived from Greek and other philosophies. Pearcey & Thaxton (1994), commenting on Historian Herbert Butterfield’s book in 1957, said that “scientific change was brought about not primarily

by new facts or observations but by transpositions that were taking place inside the minds of the scientists themselves” (p. 59).

Edlin (1999) discussed this myth from a broader view of education which would unquestionably contain science, and more specifically, evolution. He said:

Education has never been neutral, nor can it ever be. The founders of modern education acknowledged this to be true; the evidence of what goes on in myriads of classrooms daily acknowledged this to be true, and even modern thinking humanists recognize that this is so (p. 42).

In the mid-18th century, there began a New Age that was called a Secular Age in which “reason” would replace Christian faith (Jones, 1998). Even though Christian faith was not the only stream flowing into the life of Europe, most of the society and culture in Western Europe was based on it. “Christianity did have a central importance (Jones, 1998, p. 6).”

In the case of Darwin’s evolution, his reason or rationality was the ultimate foundation for his searching for the origin of species. It established a new faith departure from a commitment to Christianity to a commitment to rationalistic secular science. Jones (1998) concluded that Continuity is the ground of Darwin’s religious belief and rationality. On his letter to D. Mackintosh in 1882, Darwin said, “I cannot avoid believing the possibility that this will be proved some day in accordance with the law of continuity” (Darwin & Seward, 1903, p. 171). Furthermore, Darwin (1859) mentioned the word “believe” or similar words more than 200 times which indicated that he was uncertain about his theory. Evolutionary theory is alike Christianity; it is a belief-based theory. Meanwhile, Babcock (2011) affirmed the story of Darwin’s deathbed experience to show how Darwin came to the conclusion of natural selection as the prime agency of the origin of species. Darwin showed his regretful expression to Lady Hope, the British evangelist, and said, “I was a young man with unformed ideas, and people made a religion of them” (Babcock, 2011, p. 77).

Evolution as Humanist Naturalist Philosophy

If we accept that there is no religious neutrality in any aspect of our lives, then there is no difference between evolution and evolutionism (Jones, 1998). Jones affirmed, “The reality is that all life and thought occurs—and can only occur—within the context of faith, a context of ultimate commitments” (1998, pp. 66–67). The theory of evolution emerged based on the ideas of some people who had religious commitments to something. Darwin believed that natural selection was the sole cause of appearing new species.

Darwin's evolution suggested that God has nothing to do with new species' appearances. Some of Darwin's proponents who are Christians argued that God set the laws which are suitable for natural selection to be the cause (Stannard, 1997). Darwin's idea of natural selection leads to the important question: Who is the authoritative and final being at the base of Genesis 1? God or man? Darwin did not choose to presuppose God, but asserted that the human mind was the basic reality of being (Rushdoony, 1967). Tong (2006b) added that Darwin came to the conclusion by his own imagination, not by the result of experiments or evidences. Then Tong exclaimed, "It was clear that this book is not a scientific book, but an imagination book" (2006b, p. 4). In other words, Darwin's humanist thinking directed him to the "anti-God position of apostate and fallen man" (Rushdoony, 1967, p. 48).

Darwin's evolution implied that all people have no responsibility to God. Human beings are seen solely as the product of a long history of evolution from other animals. Therefore, as animals, they have no moral obligation when they kill others. One of the Church fathers, Saint Augustine of Hippo said, "It is ridiculous to condemn the faults of beasts and trees, and other such mortal and mutable things as are void of intelligence, sensation, or life, even though these faults should destroy their corruptible nature" (2009, p. 290). Darwin's evolution contrasted significantly from what Scripture says about human beings that they are responsible creatures and have responsibilities to serve and glorify God (Rushdoony, 1967).

Darwin's evolution was rooted in the mechanistic tradition (Pearcey & Thaxton, 1994). His theory of natural selection is materialistic and it became clear that "so many people have tried to wed his theory to design and purpose" (Pearcey & Thaxton, 1994, p. 114). For example, the botanist, Asa Gray tried to find a divine plan within the theory and Darwin dissented and argued that this was not what he meant at all. Darwin replied Asa Gray on a letter dated May 8th, 1868, "If the right variations occurred, and no others, natural selection would be superfluous" (Poulton, 1896, p. 117). In other words, Darwin wanted to say that "natural selection is to demonstrate how the appearance of design might emerge from undesigned random changes" (Pearcey & Thaxton, 1994, p. 114).

Darwin's theory of evolution was based on the assumptions of theological naturalism, which had powerful arguments that influenced many people before and until Darwin's time (Hunter, 2007). Hunter mentioned some theological naturalists such as Thomas Burnet, Gottfried Leibniz, and Immanuel Kant, who pointed out that the world must have arisen strictly by secondary causes. He added that "although the driving concern for naturalists was theological and they were not promoting atheism, there can be little doubt that today their ideas have fueled religious skepticism" (Hunter, 2007, p. 117). This theological naturalism gave Darwin a context in which to construct his ideas of whom caused or how the new species appeared. Paul Nelson in Hunter (2007) commented on Darwin's point of view: "Darwin repeatedly argued that while he could

make sense of the data with his new theory, notions of divine creation utterly failed” (p. 121). Hunter (2007) addressed how Darwin came to his conclusion where only naturalistic explanations may be considered as a blind spot of science. For the purpose of this thesis we view the theory of evolution as a humanist naturalist philosophy and not merely a scientific fact.

This is My Father’s World – The Place of Science within a Christian Worldview

Branch (2005) asserted that some atheist scholars such as evolutionary biologist Richard Dawkins, the late Stephen Jay Gould, National Center for Science Education director Eugenie Scott, and philosopher Massimo Pigliucci give the impression that science and religion are totally incompatible and that religion stands in the way of progress. For example, Eugenie Scott has frequently made the assertion that Christianity is a “Science-Stopper” as reported by Sam Lazaro (2001). Scott argued that Intelligent Design is based on Christianity and stops science in its track because you stop looking. Judson (2010) reported similar statement made by a biology professor at Brown University, Kenneth Miller. Miller said, “When the supernatural world is offered as an explanation for occurrences in the material world, however, that’s a science stopper” (Judson, 2010, p. 63). Another prominent evolutionary biologist, a Catholic philosopher, John F. Haught (2001) made a statement in his book Responses to one hundred one questions on God and evolution, “A god-of-the-gaps approach is a science stopper, since it discourages scientists from digging deeper into the process of nature” (p. 18). What he meant with God-of-the-gaps approach was the attempt “to locate God’s activity within or at level of natural biological causation” (p. 18).

To say that Christianity has nothing to do with science is a misleading argument. Instead Christianity, which is based on the Bible, received a mandate from the Creator God to rule over His creations (Genesis 1:28). Pearcey (2005) wrote a bold article, “Christianity is a Science-Starter, not a Science-Stopper” for the Areopagus journal. She mentioned that some other beliefs such as Polytheistic Religions, Eastern Pantheisms, and Classical Greek Philosophy never produced modern science. Instead she maintained that Christianity is a Science-Starter where she quoted Mary Hesse’s description of how Christianity started modern science: “There has never been room in the Hebrew or Christian tradition for the idea that the material world is something to be escaped from, and that work in it is degrading, instead, material things are to be used to the glory of God and for the good of man” (Pearcey, 2005, p. 8). Pearcey (2005) pointed out that there were some highly educated people who remained ignorant of this fact. She pointed to the history of Enlightenment figures such as Voltaire, Gibbon, and Hume who wanted to discredit Christianity while promoting rationalism. They promoted a new term for the Middle Ages Era as the “Dark Ages” referring to the Church authorities. Then they assumed that modern science would be a new light of thinking to battle the “darkness” of Church

traditions and established doctrines. Pearcey concluded, “The history of science is often cast as a secular morality tale of enlightenment and progress against the dark forces of religion and superstition” (2005, p. 8).

The perspective of this thesis is that science with its clear epistemic foundations has a real and significant place as one tool to help us explore the world when it is located within an all-encompassing Christian worldview.

More than a century ago, Maltbie Davenport Babcock demonstrated this reality. Babcock was a pastor in Lockport, New York who liked to hike in the hills near his house. It had a beautiful view of farms, and Lake Ontario about 15 miles distant (Adams, 2011). He found an inspiration through his hiking and made a poem entitled *My Father’s World*, referring to his answers to the people who asked him where he was going on those morning jogs. “I am going to see my father’s world”, he said. (Renfrow & Montgomery, 2002, p. 20). Even though he never published his writings, his wife Catherine collected and published many of his writings in a book entitled *Thoughts for Everyday Living* in 1901, not long after he died. Here are five of sixteen original verses of *My Father’s World*, a poem created by Babcock (1901):

This is my Father’s world. On the day of its wondrous birth,
The star of light in phalanx bright. Sang out in heavenly mirth.

This is my Father’s world. E’en yet to my listening ears,
All nature sings, and around me rings. The music of the spheres.

This is my Father’s world. I rest me in the thought,
Of rocks and trees, of skies and seas, His hand the wonders wrought.

This is my Father’s world. The birds that their carols raise,
The morning light, the lily white, declare their Maker’s praise.

This is my Father’s world. He shines in all that’s fair,
In the rustling grass I hear Him pass, He speaks to me everywhere (p. 180).

About fourteen years after the Babcock book was published, Franklin Lawrence Sheppard arranged the music for *My Father’s World* when he edited the church school hymnal *Alleluia* (Adams, 2011). The unity of poem and music has become one of the famous hymnal songs still sung today.

Redeeming Science Teaching in Grade 7

To address the question of redeeming science teaching in Christian schools in Indonesia, it is helpful to consider possible approaches to psychology by Lawrence Crabb, a Christian psychologist in Pazmino (2008). Pazmino suggested that “Christian educators must use the wisdom gained from psychology to enrich and embellish their thought and practice to the end that God might be glorified” (p. 197). This approach was derived from Saint Augustine of Hippo as “spoiling the Egyptians” which involved searching for truth in all areas and affirming that all truth is God’s truth (Pazmino, 2008). For the purpose of this thesis, we consider three developmental aspects: Piaget’s cognitive development, Kohlberg’s moral development, and Fowler’s faith development.

The importance of this curriculum for Christian students in grade 7 summarized in Table 4 as follows:

Table 4 Adolescents’ Age

	Piaget’s Cognitive Development	Kohlberg’s Moral Development	Fowler’s Spiritual Development	Brain Development (Weinberger, Elvevåg, & Giedd)
Stages	Formal operational (12–16 years)	Conventional Morality	Synthetic–Conventional Faith	Adolescence
Indicators	Individuals move beyond concrete experiences and begin to think abstractly.	Good interpersonal relationships and maintaining the social order	May also be described as confirming faith	Adolescence is a time of profound brain growth and change

Note: Based on indicators of each theorist above, adolescents begin to think abstractly, maintaining the social order, confirming faith, and their physical brains are changing. So that adolescents’ age is the most suitable time to encounter “The Origins Education” than the other stages.

From a Christian worldview perspective, science should serve as a clear lens to understand nature. On one hand, Christians who receive God’s revelation through the Bible should understand better than non-Christians, including on how God works in nature. On the other, non-Christians may grasp some understandings about God’s work, because they are also made in the image of God, even when they verbally cannot admit this (Poynthress, 2006). Even though the Bible focuses on salvation, we can be sure that all the Bible says is true. For example, there is one passage in the Bible that contrasts Darwin’s prediction that humans have a common ancestor with animals. Yet humans are different than animals and humans rule over God’s creatures (Psalms 8:4–9):

4 what is mankind that you are mindful of them, human beings that you care for them?

5 You have made them a little lower than the angels and crowned them with glory and honor.

6 You made them rulers over the works of your hands; you put everything under their feet:

7 all flocks and herds, and the animals of the wild,
 8 the birds in the sky, and the fish in the sea, all that swim the paths of the seas.
 9 LORD, our Lord, how majestic is your name in all the earth!

TEACHING SCIENCE: DESIGN AND ANALYSIS

A Holistic Multiple Pathway Approach to Science Teaching

Definitions are a part of our argument, suggests Jackson (1992). Therefore, a title for the scientific study of origins in the year 7 science class should be constructed so as to reflect a Christian worldview. In many science textbooks for public middle or high schools in Indonesia, they title it the Theory of Evolution. We recommend renaming it the Origins Education. The goal will be more clearly since there is no religious neutrality. Our teenagers will learn broad views of the origins and this will avoid them being pre-emptively coerced into one religious humanist naturalist philosophy, which usually presented to them, namely the theory of evolution. Jones (1998) reminded us of the danger of Western religion, which intrudes into the world's so called neutral educations through science. He asserted:

The scientific experts will find out all we need to know, the technological experts will use that knowledge to give us the power to control nature, and the economic experts will use that power efficiently to bring about constant economic growth. Thereby, we hope to achieve the ultimate human good with peace, fulfillment, and security (Jones, 1998, p. 8).

For the purpose of this thesis, let us consider four possibilities of religious philosophies standing behind any theory of science. Rusbult (2010) explained it through the diagram below:

Table 5 Religious Philosophies of the Origin of Life

	Natural Evolution	Divine Design
Theism	Theistic Evolution or Evolutionary Creation	Young Earth Creationism (Progressive) Creationism Old Earth
Atheism	Naturalistic or Atheistic Evolution	Improbable

From Table 5 above, it is clear that there are two mainstream views related to Christianity which we have not discussed yet thoroughly, namely Theistic Evolution and Creationism. From a Biblical point of view, we have already discussed and rejected Naturalistic or Atheistic Evolution. Moving right horizontally from Atheism and down vertically from Divine Design, we encounter the box labeled 'improbable'. This indicates that a merging of these two perspectives (Atheism and Divine Design) is improbable. This is because on one hand, Atheism means there is no God, and on the other, Divine Design needs God as the Prime Cause of everything.

Moving horizontally to the right from the point of view of Theism, there is no scientifically supportable truth in the area of origins that is knowable at this time and supported by all Christians (Tulloch, 2009). For example: some Christians may agree that the age of the universe or earth must be very old based on the distance of stars. As Falk says, “If the light has been traveling billions of years to reach us, then the universe must be at least that old” (2004, 79–80). But other Christian scientists think differently, believing that the earth is young. Berg (2006) says, “If we assumed only half of the current growth rate and start with one couple, it would take less than 4,000 years to achieve today’s population” (para. 17).

Tulloch asserted that “the issue is not so much which view is correct, but what is the underlying faith position that accompanies the view” (2009, p. 2). Our students should find their places in the biblical story/Christian worldview where there are answers to the following questions (Colson & Pearcey, 1999; Bartholomew & Goheen, 2009):

1. Creation: Where did we come from, and who are we?
2. Fall: What has gone wrong with the world?
3. Redemption: What can we do to fix it?

Colson & Pearcey (1999) assured that “...Only Christianity provides credible, defensible answers to life’s most crucial questions, and only Christianity offers a reasonable strategy for how we are to live in the real world” (p. xiii).

Jones (2011) gives some interesting examples of how different worldviews will explain or think differently in science teaching at the grade 7 levels. For example, he discusses silicon. In chemistry, people who are committed to an economic rationalist worldview will think silicon is all about transistors and computer chips. Yet from a Christian worldview, we see silicon as the key element of rocks that God has made. Silicon oxides and silicates make up the majority of rock. Jones says, “No silicon, no rocky planets; no rocky planets, no life” (2011, p. 8). He added, “We are establishing the amazing design of our world as well as laying the foundations for considering our calling to stewardly and responsible use of the resources entrusted to us by God” (2011, p. 9).

When we recommend to our teenagers to develop their critical thinking and to be aware of any worldviews around them, it is helpful to consider the pattern that Edlin (2010) created as “A mindset for evaluating the world around us” (p. 1). We can use this as a template to criticize any movies, books, articles, news, curricula, or even how teachers arrange their classrooms, which are not religiously neutral:

1. Report: What is actually involved and withhold any preliminary judgment.
2. Contextualize: Explore and explain the cultural/historical milieu in which the

resource/article is located.

3. Critique: Critique the resource/article and its embedded worldview from a biblical worldview.

4. Respond: How Christians should live in response to any resources or articles using Romans 14 principles:

- Be prepared to argue as a Christian.
- This must be done with humility which recognizes the frailty of our own position.
- Carry out action as our response in our lives.

Integrated Subject Teaching on the Issue of Origins

Redeeming the science teaching of evolution at grade 7 means to redeem the other areas of teaching as well. Jones (1998) claimed that Christ is the Redeemer, the Creator, and the Sustainer of the universe (Colossians 1:15–2:15; Hebrews 1:1–3). It means that Christ is the Redeemer of all areas of our lives. There is no separation between secular and sacred things. Edlin (2009) said that this separation is rooted back in the dualistic idea of Greek philosopher Plato, who influenced Western thought, which then permeated the entire globe through globalization and westernized media. If we admit the foundational and authoritative rule of the Bible in our lives, then we should integrate schools' curricula, so that it is rooted in the Bible as well.

Abraham Kuyper, a former prime minister of the Netherlands, a noted clergyman and theologian, and a prolific journalist in 1880 said, "There is not a square inch in the whole domain of our human existence over which Christ who is Sovereign over all does not cry, 'Mine!'" (Bratt, 1998, p. 461). Kuyper's assertion was echoed around the world as a New Reformation Movement. Sioux Center Christian School (SCCS), a Christian School in Iowa, which has been established for more than 100 years, has based its ministry on Kuyper's belief. The mission of the school is "to develop in each of God's children knowledge and understanding of Christ and His creation so that they can obediently serve God and others in their work and play" (About Sioux Center Christian School, n.d.).

One of SCCS' teachers, David Mulder who taught science some years ago for grade 7 and 8, made a faith statement about his science teaching. He insisted that curriculum is far broader than just the academic subjects of school such as mathematics, science, history, and art. He believed that "all the components of the school's curriculum must point to living a life of responsible discipleship" (Mulder, 2008, para. 6).

For the purpose of this thesis, we recommend approaching the issue of Origins by conducting

interdisciplinary programs and a team teaching model. There are two vitally important reasons we should approach this issue through integrated subject teaching, as Schmidt (1998) said:

1. There is a single integrated truth but the disciplines tend to have their own focus of study and lens (methodology). From a Christian perspective, we learn that the fear of the Lord is the beginning of knowledge (Proverbs 1:7). There is only one source of knowledge, He is God. Arthur Holmes (1977) rightly said, “All truth is God’s truth”.
2. We should prepare our students to engage life issues and to have holistic perspectives rather than to be an expert in one discipline area but unaware of their lives patterns for other areas. Schmidt (1998) quoted James Davis who said, “The disciplines can be reductionist, seeing the whole world through their own lenses. They simply ignore the phenomena that exist outside their purview” (Davis, 1995, p. 37).

Arthur Holmes (1975) asserted that human beings are reflective, thinking people. To be reflective means they should “see things in relationship, to organize ideas into an ordered whole, to be systematic, to work toward a unified understanding” (p. 30).

CONCLUSIONS

It has been more than one hundred and fifty years since Charles Darwin proposed his idea which affected Western society and nowadays is also influencing Eastern society, including Indonesia. The theory of evolution was accepted as one of the greatest findings in the Nineteenth Century and was categorized neutral to any beliefs. This thesis certainly agrees with the refutation of the myth of religious neutrality. Each theory, hypothesis, or even a title from any issue is based on some assumptions of religious beliefs. From a Christian worldview, we discover that Darwin’s evolution was based on humanist naturalist philosophy which did not acknowledge God as the source and the cause of nature. Rather, Darwin proposed a Natural Selection replacing God’s position and made it as the ultimate cause for the appearance of new species/lives.

It is clear that secularism has intruded into many parts of the globe, including Indonesian’s curricula. Since Indonesian curricula development depends on Western society, it produces no difference to the West which has been affected by the new age of secularization for more than two hundred and fifty years (Jones, 1998). However, Christianity in Indonesia has not realized how dangerous this situation is for the next generations. Also the authoritarian policy of the Suharto regime, which ruled for thirty two years made Christianity go nowhere. Since the Indonesian government reformed the educational system and made the 2004 curriculum, it has opened a new way of thinking where schools can modify their own curriculum suiting it to their own purposes using the government curricula as a benchmark.

There is a wide opportunity for Christianity in Indonesia to establish her identity and to become salt and light. Concretely, this thesis recommends relocating evolution's discussion from the government's designation of grade 12 to grade 7. Supported by some research on human development of Neuroscience, Piaget's cognitive development, Kohlberg's moral development, and Fowler's faith development, it is necessary for Christian teenagers to begin their encounter with the philosophy of science, especially on evolutionary theory, before their brains have developed completely. In teenagers' age, their brains change and growth, they start to think abstractly, to maintain good relationship with others, and confirming their faith. For this purpose, this thesis recommends changing the title of discussion from "The Theory of Evolution" to "The Origins Education" which will give students a horizon of the issues more clearly.

REFERENCES

- About Sioux Center Christian School. (n.d.). Retrieved from http://www.siouxcenterchristian.com/about_sccs.cfm
- Adams, R. W. (2011, April 19). This is my father's world. Retrieved from <http://www.hymntime.com/tch/htm/t/i/s/tismyfw.htm>
- AllAboutGOD.com. (2011a). How did Sir Charles Lyell influence Charles Darwin? Retrieved from <http://www.allaboutsience.org/sir-charles-lyell-faq.htm>
- AllAboutGOD.com. (2011b). How did Thomas Malthus influence Charles Darwin? Retrieved from <http://www.allaboutsience.org/thomas-malthus-faq.htm>
- Augustine, Saint Bishop of Hippo. (2009). *The city of God* (M. Dods, Trans.). Lawrence, MA: Digireads.com.
- Babcock, M. A. (2011). *How can I believe when I have so many doubts?* Eugene, OR: Harvest House.
- Babcock, M. D. (1901). *My father's world*. In *Thoughts for every-day living from the spoken and written words of Maltbie Davenport Babcock* [Online version]. Retrieved from <http://www.archive.org/stream/thoughtsforever00abc#page/180/mode/1up>
- Bartholomew, C. G. (1997). Post / late? Modernity as the context for Christian scholarship today. *Themelios*, 22(2), 25–38.
- Bartholomew, C. G. (2000). *Uncharted waters: Philosophy, theology and the crisis in biblical interpretation*. In C. G. Bartholomew, C. Greene, & K. Moller (Eds.), *Renewing biblical interpretation* (Vol. I, pp. 1–39). Grand Rapids, MI: Zondervan.
- Berg, R. S. (2006). Evidence for a young earth. Retrieved from http://www.earthage.org/youngearth/evidence_for_a_young_earth.htm#Population Growth:
- Blakesley, J. W. (1839). *A life of Aristotle: Including a critical discussion of some questions of literary history connected with his works*. Cambridge, England: J. & J. J. Deighton.
- Branch, C. (2005, January). *Veritas: Science vs. Christianity*. Retrieved from <http://www.arcapologetics.org/veritas/veritas-2005-01.htm>
- Bratt, J. D. (Ed.). (1998). *Abraham Kuyper: A centennial reader*. Grand Rapids, MI: Wm B. Eerdmans.
- Bronowski, J. (1956). *Science and human values*. New York, NY: Julian Messner. Retrieved from http://sciencepolicy.colorado.edu/students/envs_5110/bronowski_1956.pdf
- Clouser, R. (2005). *The myth of religious neutrality: An essay on the hidden role of religious beliefs* (Rev. ed.). Notre Dame, IN: University of Notre Dame Press.
- Colson, C. W., & Pearcey, N. (1999). *How now shall we live?* Waco, TX: Word.
- Darwin, C. (1845). *Journal of researches into the natural history and geology of the countries visited during the voyage of H.M.S. Beagle round the world, under the command of Capt. Fitz Roy, R.N.* (2nd ed.) [Online version]. London: John Murray. Retrieved from <http://darwinonline.org.uk/content/frame?viewtype=text&itemID=F14&pageseq=1>
- Darwin, C. (1859). *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*. London: John Murray.

- Darwin, C. (1872). *The origin of species by means of natural selection, or the preservation of favoured races in the struggle for life* (6th ed.). London: John Murray.
- Darwin, E. (1794). *Zoonomia, or the laws of organic life* (Vol. 1). London: J. Johnson.
- Darwin, F., & Seward, A. C. (Eds.). (1903). *More letters of Charles Darwin* (Vol. 2). London: John Murray.
- Davidheiser, B. (1969). *Evolution and Christian faith*. Nutley, NJ: Presbyterian and Reformed.
- Davis, J. R. (1995). *Interdisciplinary courses and team teaching: New arrangements for learning*. Phoenix, AZ: American Council on Education and the Oryx Press.
- Dennett, D. C. (1995). *Darwin's dangerous idea: Evolution and the meanings of life*. New York, NY: Touchstone.
- Discovery Institute. (n.d.). Definition of intelligent design. Retrieved from <http://www.intelligentdesign.org/whatisid.php>
- Dooyeweerd, H. (1966). *The secularization of science* (R. D. Knudsen, Trans.). *International Reformed Bulletin*, 9, 2-18.
- Draper, J. W. (1874). *History of the conflict between religion and science*. New York, NY: D. Appleton.
- EadsHome Ministries. (2007). Quotes from famous scientists. Retrieved from <http://www.eadshome.com/Sciencequotes.htm>
- Edlin, R. J. (1999). *The cause of Christian education* (3rd ed.). Blacktown, Australia: National Institute for Christian Education.
- Edlin, R. J. (2009). *Worldview, Western thought and its importance for 21st century Christians* [Lecture notes].
- Edlin, R. J. (2010). *A mindset for evaluating the world around us* [Lecture notes].
- Ellegård, A. (1990). *Darwin and the general reader: The reception of Darwin's theory of evolution in the British periodical press, 1859-1872*. Chicago, IL: The University of Chicago Press.
- Elvyanti S. (2010). Indonesian curriculum history. Retrieved from http://file.upi.edu/Direktori/FPTK/JUR._PEND._TEKNIK_ELEKTRO/197311222001122-SISCKA_ELVYANTI/sejarah_kurikulum1.pdf
- Falks, D. R. (2004). *Coming to peace with science: Bridging the worlds between faith and biology*. Downers Grove, IL: InterVarsity Press.
- Flannery, M. (2010, August 20). Alfred Russel Wallace, co-discoverer of evolution by natural selection and "creationist". Retrieved from http://www.evolutionnews.org/2010/08/alfred_russel_wallace_co-disco037401.html
- Geisler, N. L. (1999). Beware of philosophy: A warning to Biblical scholars. *JETS*, 42(1), 3-19.
- Geisler, N. L. (2005). *Baker encyclopedia of Christian apologetics*. Grand Rapids, MI: Baker Academic.
- Goheen, M. W., & Bartholomew, C. G. (2009). *The true story of the whole world: Finding your place in the biblical drama*. Grand Rapids, MI: Faith Alive.
- Haarsma, D. B., & Haarsma, L. D. (2007). *Origins: A reformed look at creation, design, and evolution*. Grand Rapids, MI: Faith Alive Christian Resources.
- Haught, J. F. (2001). *Responses to one hundred one questions on God and evolution*. Mahwah, NJ: Paulist Press.
- Hoeksema, H. C. (1966). In the beginning God [Online version]. Retrieved from http://www.prc.org/books/in_the_beginning_god.html
- Holmes, A. F. (1975). *The idea of Christian college* (Rev. ed.). Grand Rapids, MI: Wm B. Eerdmans.
- Holmes, A. F. (1977). *All truth is God's truth*. Grand Rapids, MI: Wm. B. Eerdmans.
- Hunter, C. G. (2007). *Science's blind spot*. Grand Rapids, MI: Brazos Press.
- Intelligent design. (2010). In Merriam Webster Online. Retrieved from <http://www.merriam-webster.com/dictionary/intelligent%20design>
- Jackson, P. (1992). Conceptions of curriculum and curriculum specialists. In P. Jackson (Ed.), *Handbook of research on curriculum* (pp. 3-40). New York, NY: Macmillan.
- Jones, A. (Ed.). (1998). *Science in faith: A Christian perspective on teaching science*. Essex, England: Christian Schools' Trust.
- Jones, A. (2011, February). Education, indoctrination and God. Retrieved from http://www.realitybites.org.uk/downloads/RealityBites_Education-Indoctrination-and-God.pdf
- Judson, K. (2010). *Religion and government: Should they mix?* Tarrytown, NY: Marshall Cavendish.
- Kennedy, D. J., & Newcombe, J. (2001). *What if Jesus had never been born?* (Rev. ed.). Nashville, TN: Thomas Nelson.
- Leff, D. (2010). People who influence Darwin. Retrieved from: http://www.aboutdarwin.com/people/people_01.html
- Leff, D. (2010). What was Darwin like as a child? (up to about age 9). Retrieved from:

- <http://www.aboutdarwin.com/darwin/whowas.html>
- Lewis, A. (2010). WordWeb (Version 6.3) [Computer software]. Princeton, NJ: Princeton University. Retrieved from <http://wordweb.info/>
- Malthus, T. R. (1798). *An essay on the principle of population, as it affects the future improvement of society with remarks on the speculations of Mr. Godwin, M. Condorcet, and other writers*. London: J. Johnson.
- Matroji. (2006). *Sejarah untuk SMP kelas VII [7th grade History]*. Jakarta, Indonesia: Erlangga.
- Meyer, S. C., & Keas, M. N. (2001, May 16). The meanings of evolution. Retrieved from <http://www.discovery.org/scripts/viewDB/filesDB-download.php?id=305>
- Mulder, D. (2008, October 27). Faith statement. Retrieved from <http://sites.google.com/site/mulderscience/Home/faith-statement>
- Nurhayati, N. (2007). *Biologi bilingual untuk SMP/MTs kelas IX [9th grade Biology (bilingual)]*. Bandung, Indonesia: Yrama Widya.
- Nurhayati, N. (2009). *Biologi bilingual untuk SMA/MA kelas XII semester 1&2 [12th grade Biology (bilingual)]*. Bandung, Indonesia: Yrama Widya.
- Osborn, H. F. (1924). *From the Greeks to Darwin: An outline of the development of the evolution idea* (2nd ed.). New York, NY: Macmillan.
- Pazmino, R. W. (2008). *Foundational issues in Christian education: An introduction in evangelical perspective* (3rd ed.). Grand Rapids, MI: Baker Academic.
- Pearcey, N. R. (2005). Christianity is a science-starter, not a science-stopper. *Areopagus Journal*, 5(1), 4-9.
- Pearcey, N. R., & Thaxton, C. B. (1994). *The soul of science*. Wheaton, IL: Crossway Books.
- Pluralism. (2010). In *Cambridge Advanced Learner's Dictionary*. Retrieved from <http://dictionary.cambridge.org/dictionary/british/pluralism>
- Poulton, E. B. (1896). *Charles Darwin and the theory of natural selection*. London: Cassell.
- Poythress, V. S. (2006). *Redeeming science: A God-centered approach*. Wheaton, IL: Crossway Books.
- Raihani. (2007). Education reforms in Indonesia in the twenty-first century. *International Education Journal*, 8(1), 172-183. Retrieved from <http://ehlt.flinders.edu.au/education/iej/articles/v8n1/Raihani/paper.pdf>
- Renfrow, K. D., & Montgomery, J. C. (2002). *Stories of the great hymns: Short sessions on the creation of the great hymns with simplified arrangements*. Van Nuys, CA: Alfred.
- Richard Dawkins Foundation for Reason and Science (RDFRS). (n.d.). Richard Dawkins foundation: Trustees. Retrieved from <http://richarddawkins.net/pages/staff>
- Rusbult, C. (2010). Policies for origins education in public schools. Retrieved from <http://www.asa3.org/ASA/education/origins/policies.htm>
- Rusch, W. H. (1959). Darwinism, science, and the Bible. In Zimmerman, P. A. (Ed.), *Darwin, evolution, and creation* (pp. 4-35). St. Louis, MO: Concordia.
- Rushdoony, R. J. (1967). *The mythology of science*. Nutley, NJ: Craig Press.
- Sam Lazaro, Fred de. (2001, September 28). Evolution and intelligent design (Episode no. 504). Retrieved from <http://www.pbs.org/wnet/religionandethics/week504/feature.html>
- Schmidt, A. (1998). *Integration of faith and learning through curricular design: Interdisciplinary, team-taught general education*. Scholoss Bogenhofen, Austria: International Faith and Learning Seminar.
- Science. (2010). In *Cambridge Advanced Learner's Dictionary*. Retrieved from <http://dictionary.cambridge.org/dictionary/british/pluralism>
- Science. (2011). In *Online Etymology Dictionary*. Retrieved from <http://dictionary.reference.com/browse/science>
- Science. (2011). In *Oxford Dictionaries*. Retrieved from <http://www.oxforddictionaries.com/definition/science>
- Stannard, F. R. (1997). Approaching God through paradox. In J. M. Templeton (Ed.), *How large is God?* (pp. 69-94). Radnor, PA: Templeton Foundation Press.
- Taylor, I. T. (1991). *In the minds of men* (3rd ed.). Toronto, Canada: TFE.
- Tim Bina Karya Guru (TBKG). (2008). *IPA SD untuk sekolah dasar kelas V [5th grade Science]*. Jakarta, Indonesia: Erlangga.
- Tong, S. (2006a, September). Philosophy of being & philosophy of becoming. *Pillar*, 38, 1-4. Retrieved from http://www.buletinpillar.org/fileadmin/user_upload/Media/No.38_September_2006.pdf
- Tong, S. (2006b, October). Facts or hypotheses, science or pseudo-science?. *Pillar*, 39, 1-5. Retrieved from http://www.buletinpillar.org/fileadmin/user_upload/Media/No.39_Oktober_2006.pdf
- Tong, S. (2006c, November). Kelemahan bukti-bukti evolusi [The weakness of evolution evidences]. *Pillar*, 40, 1-5. Retrieved from http://www.buletinpillar.org/fileadmin/user_upload/Media/No.40_November_2006.pdf
- Tong, S. (2006d, December). Berapakah umur manusia? [How old is humanity?]. *Pillar*, 41, 1-5. Retrieved from http://www.buletinpillar.org/fileadmin/user_upload/Media/No.41_Desember_2006.pdf

- Tulloch, E. (2009, December 11). Equipping students with biblical foundations for science. Retrieved from <http://www.acsi.org/Resources/PublicationsNewsletters/ChristianSchoolEducation/tabid/681/itemid/1682/Default.aspx>
- Wangsalegawa, T. (2009). Origins of Indonesian curriculum theory and practice: Possibilities for the future (Doctoral Dissertation). Retrieved from ProQuest Dissertations & Theses database. (UMI No. AAT 3381139)
- Wardiyatmoko, K. (2007). Geografi untuk SMA kelas XI [11th grade Geography]. Jakarta, Indonesia: Erlangga.
- Weaver, W. (1948). Science and complexity. *American Scientist*, 36, 536-44. Retrieved from <http://people.physics.anu.edu.au/~tas110/Teaching/Lectures/L1/Material/WEAVER1947.pdf>
- Weinberger, D. R., Elvevåg, B., & Giedd, J. N. (2005, June). The adolescent brain: A work in progress. Washington, DC: The national campaign to prevent teen pregnancy.
- White, A. D. (1876). *The warfare of science*. New York, NY: D. Appleton.
- Wyhe, John van. (2011). Charles Darwin: Gentleman naturalist. Retrieved from <http://darwin-online.org.uk/darwin.html>