

# Geoscience and the Bible

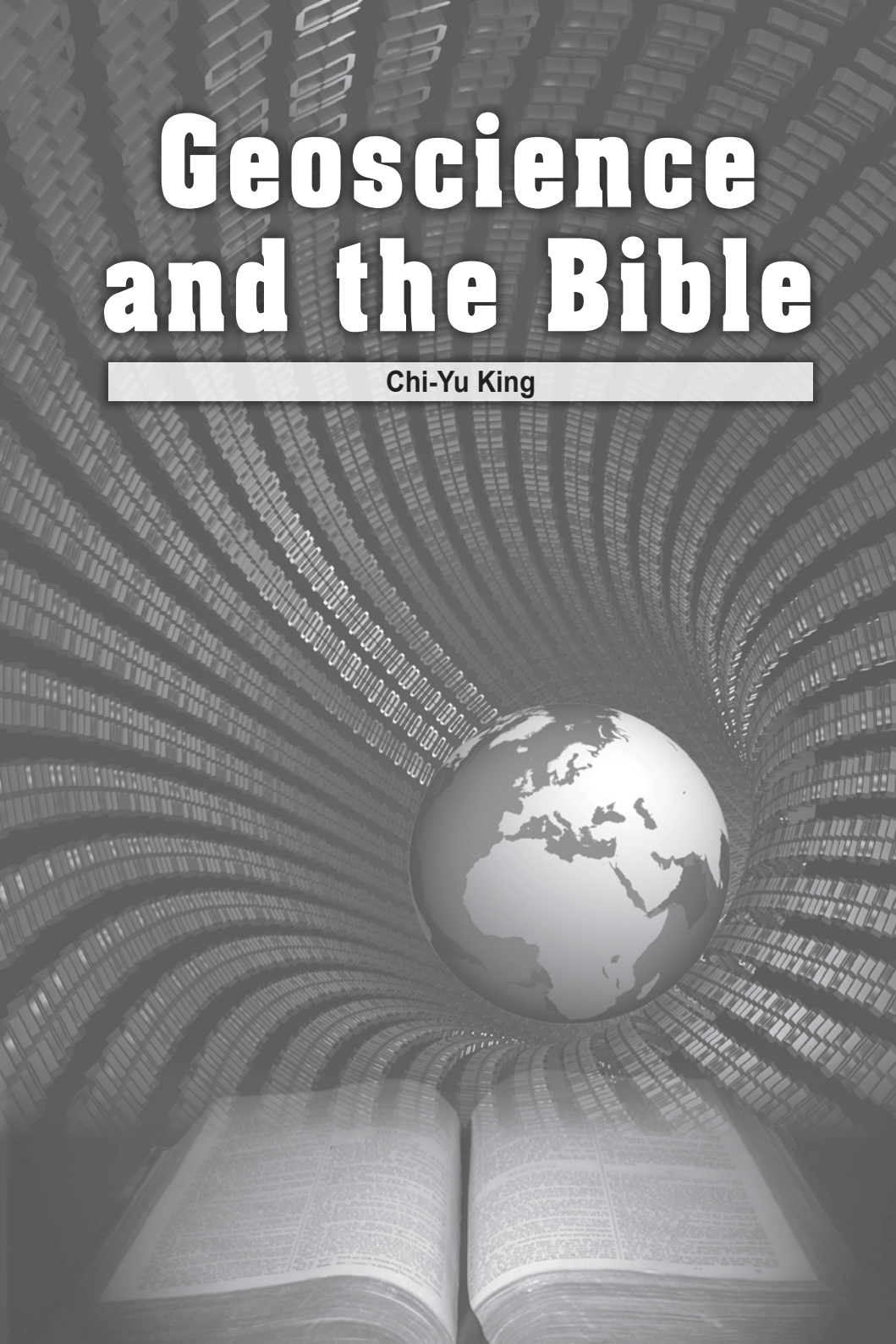
Chi-Yu King





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# **Geoscience and the Bible**

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## Preface

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Geoscience and the Bible is a broad and profound subject, which ordinary people as well as intellectuals dare not write about lightly. But thanks to God's leading, Dr. King made such an effort on the basis of his long-term research career and his Christian faith, both spanning over half a century. Hopefully, through this book, many readers may understand that not only is there no real contradiction between science and the Bible but also that many Bible statements predate scientific discoveries, sometimes by hundreds or even thousands of years.

God created the vast cosmos, including the galaxies, the earth, and all things. In contrast to this great mystery and power of His, the so-called "scientific discoveries" achieved by men are but mere shells and seaweeds picked up by children playing on the beach, for which they are proudly celebrating in joy or even boasting, "Man shall overcome Nature." What a pity!

Dr. King, after receiving a Ph.D. in Applied Physics from Cornell University, was engaged in scientific research in geophysics, with an emphasis on earthquakes, first at the California Institute of Technology, then at the University of California in Los Angeles, the U. S. Geological Survey, the National Oceanic and Atmospheric Administration, and the University of Tokyo. He and his wife are both devoted Christians, serving God, churches, and missionary organizations, such as GCCI, for many years.

This is a book not only on Science and the Bible but also on Apologetics. We believe it will be a bright lamp for the faith and truth, helping many people in this generation to "remove the cloud that shields the sun" and will serve as a wake-up call. We hope that it may help them to overcome many rational obstacles, so they may accept Christ and obtain eternal life.

May God use this book greatly, gathering a vast harvest for Himself in these end times. Amen!

Thomas Wang

March 2016

## Foreword

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The scope of geoscientific studies includes the earth, its ocean, and its atmosphere. This is also the field in which God entrusted mankind to manage, when He created them. The Bible has many descriptions in this regard, which can be compared with later geoscientific discoveries.

I have been a research geoscientist and a Christian, both for over half a century, and have published a series of short articles reporting the results of such comparison. The studies consistently show that the Biblical statements are not only not contradictory to the scientific discoveries but also pre-date them, sometimes by many centuries. These articles, and some unpublished ones, are collected here in this book, together with a personal testimony. May God use this book to help readers to overcome certain rational difficulties that they may have, so that they may recognize that the Bible is the inspired word of God, telling truths and facts. And, thus, they may believe Jesus, to whom the Bible testifies, to be the Son of God, who died on the cross to save mankind from sin and death.

The articles included here are arranged in chronological order of publication. All quoted Scriptures are from New King James Version of the Bible, unless noted otherwise. I am grateful to GCCI for publishing this book, to Annie Li for careful editing, and to Rev. Thomas Wang for writing the preface.

## Chapter 1

# Science and Christian Faith: Are they Mutually Exclusive or Contradictory?

The Biblical idea of human origin by God's creation is totally excluded today from the scientific curriculum in public schools across America on the ground of separation of science and religion. Science and religion are considered to be two different areas of human endeavor without overlap. Religion is supposed to be undertaken by faith, whereas science pursued by careful observation and reasoning. Such a clear-cut division between science and religion is, however, artificial and not appropriate, at least for Christianity. Here, and in some later articles, I'll try to explain why science and Bible-based Christianity are not mutually exclusive, nor contradictory, and why the possibility of creation should be permitted in an objective study of human origin, along with the theory of evolution.

### **Science and Bible-based Christian faith are not mutually exclusive**

Although the main message of the Bible is God's salvation of mankind from sin and death, its content touches all aspects of life, including things related to science. Many parts of the Scriptures that overlap with science are written with sufficient detail and can be rationally examined.

It is true that the Bible also contains cases of super-natural phenomena, or miracles, which seem to defy scientific explanation. Such difficulty, however, dissolves if one accepts the basic presumptions of the Bible, namely, the existence of a supernatural God who has not only created the universe but also ordained various laws to govern the natural processes. He himself, however, remains above the laws and can occasionally intervene with law-breaking doings, namely, “miracles.” The Biblical account of creation, unlike many ancient legends stated elsewhere, is self-consistent and reasonable, and is detailed enough to be examined rationally. Unfortunately many critics have not bothered to study carefully what the Bible has to say.

Not only the Bible has certain “self-evident” presumptions, such as God’s existence; so does science. Two fundamental presumptions underlying most scientific studies are atheism and materialism. While God’s existence is not proven scientifically, so is His non-existence. Many things exist but cannot be proven due to limitation of human capability. Electromagnetic waves, for example, had existed in the sky long before they were detected by mankind when radio receivers were invented. Our scientific knowledge has advanced greatly since then but is still limited. Thus, science cannot prove God’s non-existence, and atheism is a dogma, or even a religious belief, that has to be taken by faith also.

Materialism, which assumes the universe to consist of only materials (and energy) but nothing else (such as spirit), is not scientifically proven either. Based on these atheistic and materialistic presumptions, the evolution theory has ignored the unique spiritual dimension of human beings that set them apart from the animals and derived the conclusion of human’s evolution from lower animal species. This situation is somewhat like considering only the similarity in the hardware of different computers, but ignoring the differences in their software. Examining only partial evidence, no matter how rigorous, often leads to erroneous conclusions.

### Common Ingredients: Truth and Facts

The purpose of science is to search for truths on the basis of observed facts. **Truths and facts** are also the basic concern of the Bible. For example, Apostle John declared, **“That which was from the beginning, which we have heard, which we have seen with our eyes, which we have looked at and our hands have touched – this we proclaim concerning the word of**

life (Jesus)...” (First John 1:1-2). So did Luke at the beginning of his gospel, which includes many miracles like Jesus’ birth and resurrection, **“Many have undertaken to draw up an account of the things that have been fulfilled among us, just as they were handed down to us by those who from the first were eyewitnesses and servants of the word. Therefore since I myself have carefully investigated everything from the beginning, it seemed also good to me to write an orderly account for you,... so that you may know the certainty of the things you have been taught.”** (Luke 1:1-4; NIV edition). Jesus declared, **“I am the way and the truth and the life...”**, and **“Your (God’s) word is truth...”**(John 14:6; 17:17).

## Differences in Presumptions, Scope and Approaches

While having the same concern about truths and facts, the Bible is different from science in its approaches to truths, beside the above-mentioned differences in presumptions and scopes (i.e., the inclusion of spiritual dimension in the Bible).

Scientific theories are derived solely by human observation and reasoning. Because of the limitations of human’s capabilities in observation and reasoning, scientific knowledge is limited and continually evolving. Thus scientific theories are always tentative, subject to modification and refinement. For example, the previously accepted law of Conservation of Mass and the law of Conservation of Energy (or first law of thermodynamics) were later found to be not exact and were superseded by Einstein’s Special-Relativity theory (of convertibility between mass and energy).

The Biblical approach is, on the other hand, not only made by human but also by the inspiration of God. Since God created everything and is still sustaining the universe (Hebrews 1:2-3), He knows everything and should not make any mistake in the Bible He has inspired. This is why the Bible remains intact in the midst of numerous critical attacks over the past thousands of years, while scientific textbooks have to be revised every few years.

This difference in the approaches may be illustrated by considering the case of learning how to use some modern electronic equipment, such as a computer. We may either learn by experience or by studying the manual provided by the manufacturer (or both). The knowledge obtained by a user’s experience (equivalent to the scientific approach) is rather limited and will

eventually agree with what is written in manufacturer's manual (equivalent to the Bible).

Historically, there have been cases in which the Scriptures seemed to be contradictory to scientific conclusions. These apparent contradictions have later been found to be either due to misinterpretation of the Scriptures (e.g., the pope's insistence on a geocentric universe at the time of Galileo) or due to a lag in scientific discoveries (e.g., cause of earthquakes, as will be discussed in Chapter 4), sometimes by thousands of years.

As a Christian and scientist, both for more than 50 years, I have found no problem in reconciling my research with the Christian faith that recognizes the power of the almighty God. My comparative study between science and the Bible has not shown any real contradiction, and I have been repeatedly amazed by the correctness and far-sightedness of the Bible.

### Conclusions

There is no real contradiction between science and science-related matters described in the Bible. If the study of evolution theory, which is based on the scientifically unproven presumptions of atheism and materialism, is allowed in science classes at schools, why is not the possibility of creation allowed, or even mentioned? Is this practice not contrary to the spirit of unbiased open-minded free inquiry that characterizes scientific studies? Worthwhile ideas, regardless of their origin, should never be excluded from scientific pursuit of truths!

#### Quoted Scriptures

**Hebrews 1: 2-3:** "God...has in these last days spoken to us by His Son, whom He has appointed heir of all things, through whom also He made the worlds; who being the brightness of His glory and the express image of His person, and upholding all things by the word of His power..."

(Published previously in *Great Commission News*, Summer 2006)

## Chapter 2

# God Created, Made, Formed, and Established the Worlds

What is the origin of mankind? Is it through God's creation as presented in the Bible, or by evolution from some animal as proposed by Darwin (1859) and others? This question has been hotly debated for over a century, but many people involved in the debate have been inadequately educated either in science or in the Bible. (Many relevant articles can be found on the Internet using Google by searching "Evolution vs. Creation".) Having been a Christian as well as a scientist for over 50 years, I would like to present in this article my personal view of this controversy.

## 1. Some Preliminary Remarks

### Similarities and Differences between Science and Christian Faith

Science and religion are usually considered to be two entirely different realms of human endeavor; religion is to be accepted by faith, whereas science pursued by observation and logical reasoning. But for Christianity, this dichotomy is inappropriate, because the Christian Bible not only presents the message of God's love and salvation of mankind from sin and death, but also touches various aspects of human life, including scientific matters, and the descriptions are often detailed enough to be examined rationally.

Of course, the Bible includes certain miracles and wonders that contradict known natural laws, thus are seemingly scientifically impossible. But if one is willing to accept the presupposition of the existence of a supernatural God, as described in the Bible, then this difficulty becomes dissolved. For God is not only the creator of the universe, but also the One who established all the laws that scientists have discovered to be regulating the various movements in the universe. He Himself is, of course, beyond all of these laws and, when deemed appropriate, can break some to perform the so-called miracles.

Not only the Bible has some “self-evident” presuppositions—science does also. Two of the major intrinsic presuppositions of most scientific studies are atheism (no God) and materialism (nothing else exists, except mass and energy). Although the existence of God cannot be proven scientifically, so does His non-existence. There are many things in the universe that do exist but cannot be scientifically proven, due to the limitations of human’s ability. Despite the immense achievement of science today, it is still limited. Thus, atheism is also a presumption, which has to be taken by faith. So is materialism. Many scientists today do not accept God’s existence, and thus cannot accept the miracles and creation stated in the Bible.

However, the fundamental nature of the Bible is facts and truths, which is no different from science. Though, there is a difference in the way how knowledge is obtained. Scientific knowledge is obtained entirely through human observation and logical reasoning. Since man’s ability in both is limited, as mentioned above, scientific conclusions are always tentative, subjecting to refinement and modification, pending new findings. They are thus not ultimate truths. On the other hand, the Bible claims to be inspired by God, who, being the creator of all things, knows all things. Thus, the Biblical truths He inspired cannot be wrong and should be ultimate truths. Historically, scientific conclusions have often been modified, while the Bible has stayed the same over thousands of years. Despite numerous attacks, it has remained intact. Although there have been some cases in which scientific findings apparently contradict Biblical statements, they were later found to be due to either misinterpretation of the Bible or a lag in scientific findings behind the Biblical statements, as will be illustrated later.

The creation process mentioned in Genesis and many other books in the Bible was written a long time ago, over a period of about 1,500 years (approximately from 1400 BC to 100 AD) by various authors of different backgrounds. These different accounts are nonetheless very coherent and

self-consistent and, when put together, are detailed enough to be examined rationally (unlike many other ancient legends about the origin of the universe).

### **Evolution and Big-Bang Theories**

Darwin's evolution theory was proposed to explain many observations, but it cannot explain many others. Examples of the latter kind include some obviously huge differences between humans and animals. For example, why do only human beings wear clothes even when it is very hot, while no other animals do, even when it is very cold? Why can a sick person receive a blood transfusion from another person having the same blood type, even of different race, but not from any animals? Why cannot mankind (or animals) interbreed normally with other evolutionarily-related animals? Why do only humans worship God or have religious activities, while no other animals do or can do? Other well-known differences include man's great superiority in language, art, civilization, science, and technology. Throughout the known history of several thousand years, humans have made tremendous progress in these various areas, while animals seem to have remained the same without any obvious changes.

Also, the evolution theory does not answer adequately the question of "the first cause" (the ultimate origin of everything). As a matter of fact, no scientific or philosophical theory does. The evolution theory suggests that human ancestors evolved from some lower animals progressively over a long period (a hypothesis still not supported convincingly by fossil evidence as Darwin had hoped). It does not explain adequately where the first living animal or cell originated. The arguments that it was evolved from certain organic materials, which in turn was evolved from certain inorganic materials, all suffer the lack of definitive scientific evidence. Even if one accepts such arguments by faith, one still may wonder: "Where did all the inorganic materials come from?"

To answer this question of "the ultimate origin of everything," one needs to seek help from the Big-Bang theory, currently accepted in astronomy. According to this theory, the universe was not eternally in existence, but had its beginning in a "big bang," or explosion, at a certain "singular" point some billions of years ago. This theory, however, does not address adequately such questions as: What was there before the big bang? Why was there such a big bang? Why is the universe so orderly after the big bang (unlike

the messy aftermath of a big explosion ordinarily seen)? Who ordained, and is still enforcing, the various natural laws in the universe after the big bang?

As mentioned above, as a scientific theory, evolution is based on the unproven presuppositions of atheism and materialism. By assuming that there is no God and no creator, one is forced into accepting the concept of evolution of one species from another. For example, if one assumes (ridiculously) that there is no manufacturer of robots, then to explain the origin of all kinds of robots, one is forced to accept the assertion that newer and more sophisticated robots evolve automatically from some older, simpler ones, without human intervention. Likewise, by assuming that there are only materials (and energy), the theory compares only the physical parts between human and animals, not their spiritual and soulish parts, as the Bible does. The situation is somewhat like considering only the hardware of a computer without considering the software that controls the hardware. As we all know, if one considers only some partial evidence, he is very likely to reach a wrong conclusion, no matter how rigorously logic his reasoning may be.

### **Age Calculation By Biblical Genealogy**

Many people, including some Christians, think that the Bible shows that the human ancestors and the whole universe were created by God about six thousand years ago. Actually, this is not stated in the Bible, but was estimated in 1664 by Bishop Ussher of Ireland, among others, based on the genealogies given in the Bible. Bishop Ussher, however, did not realize that the words “begot” and “son” in the original languages of the Bible, Hebrew and Greek, might be used for not only the father-son relationship, but also ancestor-descendent relationships in general. For example, Jesus is called the son of David and son of Abraham (Mt. 1:1), even though they were separated by many generations. Thus Ussher’s estimation of six-thousand years may be significantly shorter than the actual length of human history stated in the Bible. In other words, the Bible does not preclude the possibility that the creation process described in Chapter 1 of Genesis took place at a significantly earlier time.

### **God Created, Made, Formed, and Established the Worlds**

Even with the above consideration, one still can not reasonably extend the period of six thousand year to millions and billions of years, as suggested by geological and astronomical evidences. There is, however, another important point mentioned in the Bible that has been commonly ignored: God created and made not just one world, but more than one. For example, He-

brews 1:2 says, "... **through whom (the Son) also He made the worlds**". The word "worlds" in the original Greek language implies the worlds that are different in time (at different time on the same earth), not in space (on different planets at the same time). This point is clearly stated in Second Peter 3:5-7: "**...the world that then existed perished, being flooded with water. But the heavens and the earth which are now preserved by the same word...**" The Bible does not provide detailed information about the previous world(s), perhaps because such information is not directly relevant to the main purpose of the Bible, which is the salvation of mankind in the present world. The possibility of the destruction of previous world(s) may, however, explain the extinction(s) of many species millions of years ago, as evidenced by fossil records.

The Bible also mentions how God created the material worlds out of "nothing" (or something invisible, non-material), namely, by speaking His word: "**By faith we understand that the worlds were framed by the word of God so that the things which are seen are not made of things which are visible.**"( Heb.11:3; see also Ps. 33:9; Jhn. 1:1-3). How God can "create" the material things out of "nothing" by merely speaking remained mysterious for thousands of years, until Einstein's discovery of mass-energy convertibility in his Special Relativity Theory published about one hundred years ago. Since, according to the Bible, God's word is powerful (thus full of energy, unlike man's word) and is living and intelligent (Heb.4:12; Jer. 10:12; Prov. 3:19), it is understandable that He could have created the orderly physical worlds full of living beings by merely speaking.

Another point often ignored by many people is that the Bible uses several different verbs in describing God's working, including: "Create" (material) things out of "nothing (material)", as well as "make," "form," and "establish" things out of existing things. For example, Isaiah 43:7 uses three of these verbs in the case of man: "**Everyone who is called by my name, whom I have created by my glory; I have formed him, yes, I have made him.**" Isaiah 45:18 even uses all four of them: "**For thus says the Lord who created the heavens, who is God, who formed the earth and made it, who has established it...**" Other scriptural verses, however, often use only one or two of these verbs for simplicity, even though God's action may have involved more. In such cases, they should not be construed as being excluding the possibility of God's other "doing" components. Man can make, form, and establish things but cannot "create" things out of "nothing" in the Biblical sense.

## Points of View in the Bible

Although all Scripture is given by inspiration of God (2 Tim. 3:16), the readers of its messages are humans, both ancient and modern. Thus, in studying science-related Bible verses, we need to keep in mind that they are sometimes written from the viewpoint of mankind on earth before the advancement of modern science, but at other times from the viewpoint of God.

## 2. God's Action Described in Genesis 1 and 2

### The Beginning (v. 1)

Having clarified the above-mentioned several points, we may now try to better understand the creation process described in Chapter 1 of Genesis (which was written about 3,400 years ago!). In verse 1:1, **“In the beginning God created the heavens and the earth,”** the verb “created” (out of “nothing”) is used. Thus it may be a statement about the very beginning of the universe, which is not inconsistent with the “Big-Bang” theory of astronomy in that the universe has a beginning. The Bible does not preclude the possibility that the big bang occurred many billion years ago, since no time frame is mentioned here. Stated elsewhere also is the expansion (stretching out) of the universe (Isa. 42:5 and 45:12), which is observed astronomically too. In addition, the Bible can explain such an occurrence better than the Big-Bang theory, because it states who did this (God) and how, by speaking (see also Jhn. 1:1 and 3: **“In the beginning was the Word, and the Word was with God, and the Word was God. [...] All things were made through Him, and without Him nothing was made that was made.”**). Thus, this great, orderly, and expanding universe did not come into existence by itself by chance, but by God's design and creation, manifesting God's great power and intelligence. Note also that the words of plural “heavens” and singular “earth” used here are both so appropriate, because in contrast to the unique earth, the heavens include not only the firmament (the earth's atmosphere; see verse 8) but also the moon, the sun, and numerous stars in the galaxies, which are much farther away. This usage, again, antedates the corresponding scientific discovery.

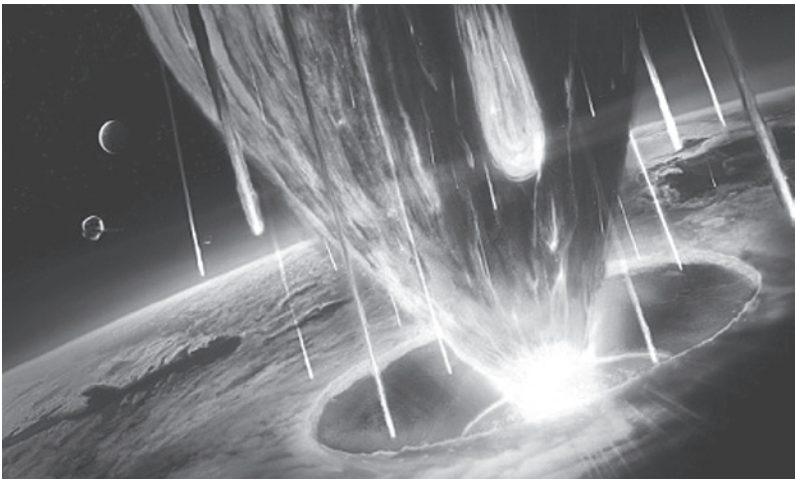
### End of the Previous World (v. 2a)

The statement **“The earth was without form, and void; and darkness was on the face of the deep”** in verse 2a is not likely to be a description of the original condition of the freshly created earth (Isa. 45:18; 1 Tim. 4:4),

because things created by God are supposedly good. It could be the condition of the earth at the end of the previous world, perhaps billions of years after the initial creation (1:1) and just prior to God's creating/making/shaping/establishing the present world. At that time, water (including vapor, fog, and cloud) covered not only the surface of the earth, but also the atmosphere up to a great height, such that the (pre-existing) sunlight could not penetrate through the atmosphere and reach the surface (even on top of the highest mountains at that time). Thus the surface was in darkness. This interpretation of the Bible is consistent with verses 6-8, as shown below.

Why had the earth "deteriorated" so much at that time? One possibility is that the previous world was destroyed by God (Jer. 4:23) because of the fall of Satan, who had been put in charge of that world, as hinted in Isaiah 14:12-17 and Ezekiel 28: 12-19, where the kings of Babylon and Tyre are commonly considered to represent Satan. The Bible does not explicitly mention when the angels were created, except that it must have been before the creation of the present world (Job 38:4-7). Other Scriptures also mentioned the ruling ability of the angels (Luk. 4:6; Heb. 2:5).

A similar judgment/destruction occurred at the time of Noah, and another is predicted to be occurring in the future (Jer. 4:23). The destruction mentioned in verse 2 may have destroyed many, if not all, creatures of that world, such as trees and animals, and thus caused their extinction, leaving their remains as fossils. Since no time frame is mentioned in Genesis 1:2, the Bible does not preclude the possibility that such fossils were many million



years old, as determined by scientific dating techniques.

How did God execute the above-mentioned destruction? One possibility is by using the well-known but rarely occurring natural phenomena of massive meteoroid/asteroid impacts. More and more scientists are now convinced that such impacts on earth were responsible for repeated extinctions of plant and animal on earth, including dinosaurs some 65 million years ago. The scenario described in Genesis 1:2 could be the result of some such impacts, primarily on water, that would have splashed huge amounts of water and other debris into the atmosphere, blocking sunlight from reaching the earth's surface and shutting down photosynthesis for a long period, thus destroying the environmental condition suitable for living. Some impacts may have triggered gigantic earthquakes, tsunamis, and/or volcanic eruptions, with even more serious consequences.

### **Preparatory Work of the Holy Spirit (v. 2b)**

The creating, making, and shaping of the present world by the triune God during a six-day period (Exo. 20:11) is then described in more detail in the following verses. In preparation, **“the Spirit of God was hovering over the face of the waters.”** (v. 1:2b). Note that the word “waters” is plural. Thus this sentence may possibly define the scope of God's work on this world at that time, namely, the earth and its atmosphere, where massive amount of waters existed.

### **Appearance of Light on the First Day of the Present World (vv. 3-5)**

On the first day of this world, God let light become visible on the earth's surface (Again, verse 3 describes the condition from the point of view of the soon to be created humans). Note that the Bible does not use the word “create” here. Thus, the light was not coming from a new source, but from the same sun that had been created at the beginning (1:1). What God did was probably to reduce the amount of water/debris in the atmosphere so that the totally dark sky became translucent, like in a cloudy day of the present time. Note also that God said that the light was good, but did not say so for the darkness (v. 1:4). This may be because darkness mostly has a connotation of sin and evil in the Bible. With the (re-)appearance of sunlight on the earth's surface after a long period of total darkness, it became possible then to distinguish night from day in a 24-hour cycle (or one earth rotation), as viewed on earth. Therefore, this day is counted as the “first” day. There is no need to

interpret this cycle as a period of thousands of years, as many people do, in order to match scientifically estimated antiquity of stars, the earth, and fossils. Because the existence of above-mentioned previous world(s) is capable of taking care of that. It is important to realize that the “first day” refers to the first day of this world, not the first day of the whole universe, which had been in existence since the very beginning of creation (v. 1). Many things had existed in the previous world(s) prior to this “first day.”

### **Second Day, Atmosphere (vv. 6-8)**

The Bible then describes how God made (not created) the air (firmament) on the second day by speaking. He did so by separating the waters above the air from the waters below. Here we see that the atmosphere had been full of waters, as interpreted above. The statement “And God called the firmament Heaven” antedates the scientific discovery that the blue sky and white/dark clouds that we see are just the earth’s atmosphere. Note that the word “heaven” used here is appropriately singular (unlike “heavens” used in verse 1), not including heavenly bodies above the atmosphere. Note also that, in spite of its importance, God did not praise the air, as He had praised light earlier and would praise the other things that He was going to make/create on the later five days. This omission may hint at the existence of the spiritual hosts of wickedness in the atmosphere (Eph. 2:2, 6:12) at that time already.

### **Third Day, Dry Land (vv. 9-13)**

Verses 9-13 describe what God did on the third day, namely, letting the dry land rise above the surface water (a common geological process) and letting various vegetation and plants grow from the ground (either newly made or from seeds left over from the previous world that began to re-appear because of the availability of light and air again). In doing so, God prepared a habitable place as well as food for humans and other land animals, which were to be created/made/formed during the next few days.

### **Fourth Day, Light sources (vv. 14-19)**

Verses 14-19 give a description of how God made the light sources in heaven (sun, moon, and stars) that are visible on earth, on the fourth day, for the purposes of time-keeping and illumination. Note that the verb used here is “made,” not “created.” Thus the sun, moon, and stars were the same ones created at the beginning of creation (v. 1). What God did on the fourth day was probably to modify the light paths from these pre-existing sources to the

earth's surface. One possible way of making such a modification is continued decreasing of the moisture/debris in the atmosphere, so that not only the light but also the light sources themselves became visible at the surface (i.e., a totally cloudy sky became partly sunny). Thus, the Bible does not preclude the possibility of the multi-billion-year age of the universe, as estimated by astronomical studies. Also since time-keeping was clearly feasible on the fourth day, any other day that is similarly described in this chapter should be a 24-hour day also, as noted above.

### **Fifth Day, Creatures in Water and Air (vv. 20-23)**

Verses 20-23 describe how God on the fifth day created (a verb used only the second time in the Bible) the animal lives (with souls) in water and air according to their kinds. This creation action also includes forming (the body) out of the ground as well (see 2:19). This account of course does not necessarily preclude the possibility that similar creatures had existed in water and air before in the previous world(s).

### **First Half of Sixth Day, Land Creatures (vv. 24-25)**

On the first half (night time) of the sixth day, God let the earth bring forth the land animals, each according to its kind (vv. 24-25), just as in the previous cases for plants and animals in water and air. The statement "each according to its kind" allows the possibility of within-the-kind physiological changes, or so-called "micro-evolution," with time in a changing environment, but does not allow the interspecies "macro-evolution" proposed by Darwin. An obvious example of such a "micro-evolution" in the Bible is that the different human races came from the same ancestors, Adam and Eve (see next paragraph and Acts 17:26). Thus, the Bible can answer satisfactorily the questions why inter-racial but not inter-species breeding and blood transfusion are feasible. Scientifically, only "micro-evolution" has been observed. To **extrapolate** improperly from "micro-evolution" to "macro-evolution" is what is seriously wrong with the evolution theory.

### **Second Half of Sixth Day, Man (vv. 26-28; 2:7)**

On the remaining half-day (possibly longer than half, including the whole period of day time), before creating the first human beings, the triune God held a unique meeting, in which they defined their qualifications (in God's image and according to God's likeness) and duty (to have dominion over the earth and other creatures on earth). Then he created Adam and Eve

(vv. 26-31). God's creation of human beings actually involved the actions of making and forming also, as stated in Isaiah 43:7. For Adam, this is also explicitly stated in slightly more detail in verse 2:7: **"And the Lord God formed man of the dust of the ground and breathed into his nostrils the breath** (the same word as "spirit") **of life; and the man became a living being."** Since God formed the human body from the same materials (the dust on the ground) as the other animals, it is not surprising that they bear physical, chemical, and biological resemblances (thus they may possibly receive organ transplants from one another). Such similarities, however, should not be construed as a proof of evolution of one species from another, to the exclusion of the possibility of through different creation/making/forming processes. This verse shows that man was given something that is unique, the **spirit**, which was not given to any other animals. Thus the Bible can reasonably explain why only humans can worship God and communicate with God (for God is spirit, Jhn. 4:24), a phenomenon which cannot be adequately explained by the evolution theory. Adam was created/made/formed to have three corresponding parts: spirit, soul, and body (1 Thes. 5:23; Heb. 4:12). God's intention was probably for man to communicate with God with his spirit and to use his soul (mind, emotion, and will) to commend his physical body to carry out God's assignments in this physical world.

Concerns have been raised as to whether there was enough time on the sixth day for Adam to have done all the things described in 2:15-23. Since it was during daytime and the duration might be slightly longer than 12 hours, as mentioned above, it should not be impossible for him to do so, if so empowered by God.

Concerning the last question posted previously—why only mankind wears clothes—the Bible has also given a reasonable explanation. Like all other animals, Adam and Eve originally did not wear clothes either (2:25). They began to wear clothes only after sinning against God by disobeying God's command not to eat the fruit of the tree of knowledge of good and evil. They did so in order to cover up their shame (3:7).

### 3. Who Created God?

One might ask, "Who created God?" To this question, the Bible has also answered: **"I am who I am** (or simply, I am)." (Exo. 3:14). "I am" means He is not a created being, but is "self-existing" and "everlasting." He has always existed and will exist throughout eternity. He is the ultimate source, the first cause, of everything.

## 4. Conclusion

The creation/making/forming/establishing process described in the Bible, if properly understood, gives a better explanation than the Evolution and Big-Bang theories, regarding human origin and the first cause of everything. This is because the Bible has taken into account the existence of human's spirit, which other animals do not have. Unlike many ancient legends, the Bible has provided a description that does not truly contradict any scientific evidence, whether it be archaeological, biological, astronomical, or geological. This finding is amazing, especially because the Biblical account was written so many years ago. This is one of the many indications, showing that the Scriptures are given by the inspiration of God (2 Tim. 3:16), who is the creator and ultimate source of everything.

### Quoted Scriptures

**Matthew 1:1:** "The book of the genealogy of Jesus Christ, the Son of David, the Son of Abraham."

**Hebrews 11:3:** "By faith we understand that the worlds were framed by the word of God, so that the things that are seen were not made of things which are visible."

**Psalms 33:9:** "For He spoke, and it was done; He commanded, and it stood fast."

**John 1:1-3:** "In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things were made through Him, and without Him nothing was made that was made."

**Hebrews 4:12:** "For the word of God is living and powerful, and sharper than any two-edged sword, piercing even to the division of soul and spirit, and of joints and marrow, and is a discernor of the thoughts and intents of the heart."

**Jeremiah 10:12:** "He has made the earth by His power, He has established the world by His wisdom, and has stretched out the heavens at His discretion."

**Proverbs 3:19:** "The LORD by wisdom founded the earth; by understanding He established the heavens."

**2 Timothy 3:16:** "All Scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness."

**Genesis 1:1-27, 31:** "In the beginning God created the heavens and the earth. The earth was without form and void; and darkness was on the face of the deep. And the Spirit of God was hovering over the face of the wa-

ters. Then He said, 'Let there be light', and there was light. And God saw the light, that was good; and God divided the light from the darkness. God called the light Day, and the darkness He called Night. So the evening and the morning was the first day. Then God said, 'Let there be firmament in the midst of the waters, and let it divide the waters from the waters.' Thus God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament; and it was so. And God called the firmament Heaven. So the evening and morning were the second day. Then God said, 'Let the waters under the heavens be gathered together into one place, and let the dry land appear'; and it was so. And God called the dry land Earth, and the gathering together of the waters He called Seas. And God saw that it was good. Then God said, 'Let the earth bring forth grass, the herb that yields seed according to its kind, and tree that yields fruit, whose seed is in itself according to its kind. And God saw that it was good. So the evening and the morning were the third day. The God said, 'Let there be lights in the firmament of the heavens to divide the day from the night; and let them be for signs and seasons, and for days and years; and let them be for lights in the firmament of the heavens to give light on earth'; and it was so. Then God made two great lights: the greater light to rule the day, and the lesser light to rule the night. He made the stars also. God set them in the firmament of the heavens to give light on the earth, and to rule over the day and over the night, and to divide the light from the darkness. And God saw that it was good. So the evening and the morning were the fourth day. Then God said, 'Let the waters abound with an abundance of living creatures, and let birds fly above the earth across the face of the firmament of the heavens.' So God created great sea creatures and every living thing that moves, with which the water abounded, according to their kind, and every winged bird according to its kind. And God saw that it was good. And God blessed them, saying, 'Be fruitful and multiply, and fill the waters in the seas, and let birds multiply on the earth.' So the evening and the morning were the fifth day. Then God said, 'Let the earth bring forth the living creature according to its kind: cattle and creeping thing and beast of the earth, each according to its kind'; and it was so. And God made the beast of the earth according to its kind, cattle according to its kind, and everything that creeps on the earth according to its kind. And God saw that it was good. Then God said, 'Let Us make man in Our image, according to Our likeness; let them have dominion over the fish of the sea, over the birds of the air, and over the cattle, over all the earth and over every creeping thing that creeps on the earth.' So God created man in His own image; in the image of God He created him; male and female He created them.... Then God saw everything that He had made, and indeed it was very good. So the evening and the morning were the sixth day."

**Isaiah 42:5:** "Thus says God the LORD, who created the heavens and stretched them out, who spread forth the earth and that comes from it, who gives breath to the people on it, and spirit to those who walk on it."

**Isaiah 45:12:** "I have made the earth, and created man on it. It was I - my hands that stretched out the heavens, and all their host I have commanded."

**Isaiah 45:18:** "For thus says the LORD, who created the heavens, who is God, who formed the earth and made it, who has established it, who did not created it in vain, who formed it to be inhabited: I am the LORD, and there is no other."

**1 Timothy 4:4:** "For every creature of God is good, and nothing is to be refused if it is received with thanksgiving."

**Jeremiah 4:23:** "I beheld the earth, and indeed it was without form, and void; and the heavens, they had not light."

**Isaiah 14: 12-17:** "How you are fallen from heaven, O Lucifer, son of the morning! How you are cut down to the ground, you who weakened the nations! For you have said in your heart: 'I will ascend into heaven, I will exalt my throne above the stars of God; I will also sit on the mount of the congregation on the farthest sides of the north; I will ascend above the heights of the clouds, I will be like the Most High.' Yet you shall be brought down to Sheol, to the lowest depths of the Pit. Those who see you will gaze at you, and consider you, saying: 'Is this the man who made the earth tremble, who shook kingdoms, who made the world as a wilderness and destroyed its cities, who did not open the house of his prisoners?'"

**Ezekiel 28:12-19:** "Son of man, take up a lament for the king of Tyre, and say to him, 'Thus says the Lord God: 'you were the seal of perfection, full of wisdom and perfect in beauty. You were in Eden, the garden of God; every precious stone was your covering..... The workmanship of your timbrels and pipes was prepared for you on the day you were created. You were the anointed cherub who covers; I established you; you were on the holy mountain of God; you walked back and forth in the midst of fiery stones. You were perfect in your ways from the day you were created, till iniquity was found in you. By the abundance of your trading you became filled with violence within, and you sinned; therefore I cast you as a profane thing out of the mountain of God; and I destroyed you, O covering cherub, from the midst of fiery stones. Your heart was lifted up because of you beauty; you corrupted your wisdom for the sake of your splendor; I cast you to the ground, laid you before kings, that they might gaze at you. You defiled your sanctuaries by the multitude of your iniquities, by the iniquity of your trading; therefore I brought fire from your midst; it devoured you, and I turned you to ashes upon the earth in the sight of all who was you. All who knew you among the people are astonished at you; you have become a horror, and shall be no more forever."

**Job 38:4-7:** "Where were you when I laid the foundation of the earth? Tell me, if you have understanding. Who determined its measurements? Surely you know! Or who stretched the line above it? To what were its foundations fastened? Or who laid its cornerstone, when the morning stars sang together, and all the sons of God shouted for joy?"

**Luke 4:6:** "And the devil said to him, 'All this authority I will give You, and their glory; for this has been delivered to me, and I give it to whomever I wish.'"

**Hebrews 2:5:** "For He has not put the world to come, of which we speak, in subjection to angels."

**Jeremiah 4:23:** "I beheld the earth, and indeed it was without form, and void; and the heavens, they had no light."

**Exodus 20:11:** "For in six days the LORD made the heavens and the earth, the sea, and all that is in them, and rested the seventh day. Therefore the LORD blessed the sabbath day and hallowed it."

**Ephesians 2:2:** "in which you once walked according to the course of this world, according to the prince of the power of the air, the spirit who now works in the sons of disobedience."

**Ephesians 6:12:** "For we do not wrestle against flesh and blood, but against the principalities, against powers, against the rulers of the darkness of this age, against spiritual hosts of wickedness in the heavenly place."

**Isaiah 43:7:** "Everyone who is called by my name, whom I have created for My glory; I have formed him, yes, I have made him."

**John 4:24:** "God is Spirit, and those who worship Him must worship in spirit and truth."

**1 Thessalonians 5:23:** "Now may the God of peace Himself sanctify you completely; and may your whole spirit, soul, and body be preserved blameless at the coming of our Lord Jesus Christ."

**Hebrews 4:12:** "For the word of the God is living and powerful, and sharper than any two-edged sword, piercing even to the division of soul and spirit, and of joints and marrow, and is a discernor of the thoughts and intents of the heart."

**Exodus 3:14:** "And God said to Moses, 'I AM WHO I AM.' And He said, 'Thus you shall say to the children of Israel, I AM has sent me to you.'"

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## Chapter 3

# Volcanic Eruptions



*Fig. 1*

The Eyjafjallajökull volcano in Iceland began to erupt on the 14th of April 2010. It ejected a large amount of steam and volcanic ashes into the atmosphere, up to an elevation as high as 9 km (Fig. 1). Although this eruption was not large in scale, its strategic location caused the erupted ashes to drift with the atmospheric into the flight paths of many airplanes in several countries in Europe and north Africa, and thus forced the cancellation of many flights, stranded millions of passengers, and resulted in unprecedented chaos and inconvenience.

In the following, we shall discuss briefly various aspects of volcanic eruptions, such as: What are their causes? What are their environmental impacts? How many types of volcanoes are there? What should governments and people do to mitigate volcanic destruction?

### Distribution of Volcanoes

Globally, there are five or six hundred volcanoes above sea level, half of them being highly dangerous. There are about 50 eruptions every year. The distribution of volcanoes is not uniform; about 80% of them being located along the so-called Circum-Pacific Earthquake and Volcano Belt, another 15% along the various mid-ocean ridges and some rift valleys, such as the East-African Rift Valley; and others are located in the Mediterranean sea

and its coastal areas, as well as at certain “hot-spots,” such as the one under the Hawaiian islands.

## Plate Tectonics Theory

Why are most volcanoes and earthquakes located along such belt-shaped regions? This was not well understood until the so-called Plate Tectonics theory was established in the 1960s. According to this theory, the earth's outer solid shell, the lithosphere, is not a single piece, but consists of a dozen or more giant plates of different sizes, each about 50 -100 km thick (Fig. 2). These plates are carried by a hotter (1100 -1200 degrees Celsius) asthenosphere, which is convecting below at a depth of 75 -250 km and moving these plates relative to each other at a slow speed of several cm per year. The boundaries of the plates (great geologic faults) may be classified into three categories, according to their directions of relative movements (Fig. 3):

- Divergent boundary. The two plates on both sides of the boundary are moving apart, and the hot magmatic materials under the plates are rising up to form a rift valley, as in the case of the mid-ocean ridges. These materials are then solidified, gradually forming new crust at the ocean-bottom. At certain places, where the accumulation of the erupted lavas are relatively large, there the volcanic islands are gradually formed. Iceland is a volcanic island located on the mid-Atlantic ridge.
- Convergent boundary. The two bordering plates are colliding with each other, and the denser plate is subsiding into the asthenosphere under the other plate. When the water-containing materials, which have lower melting temperature, in the subsiding plate move to the asthenosphere of



Fig. 2

higher temperature and pressure, they are partially melted into some gas-containing magma, which gradually rises through fissures into the magma chambers of some volcanoes. When the pressure in a magma chamber is increased to a critical point, the stored magma begins to erupt at the crater vent of the volcano or through its side fissures. If the colliding plates are both oceanic, then they gradually form an oceanic trench, and the rising lava often forms a chain of volcanic islands in the overriding plate. Japanese islands are such a chain. If an oceanic plate collides with a continental plate, which has less density, then they form some coastal ranges and volcanoes, such as the Andes in western South America. If the colliding plates are both continental with comparable densities, then they form high mountains. The highest mountain in the world, the Himalayas, resulted from the collision between the Indian and the Euro-Asian plates.

- Transform or strike-slip boundary. The two bordering plates are moving horizontally relative to each other. An example of such a boundary is the San Andreas fault in California. Earthquakes may occur along all of these types of boundaries, but volcanoes may occur only along the divergent and convergent boundaries, where magma exists.

As to certain volcanoes located in the interior of a plate, such as the Hawaiian islands in the Pacific, they may be explained by the existence of some thermal column in the asthenosphere under the plate; when the plate slides over the column, the uprising hot magma moves through some fissures of the plate and forms these islands over a long period. This possible mechanism may explain why such volcanoes are arranged chronologically, with the older ones being located further away from the column.

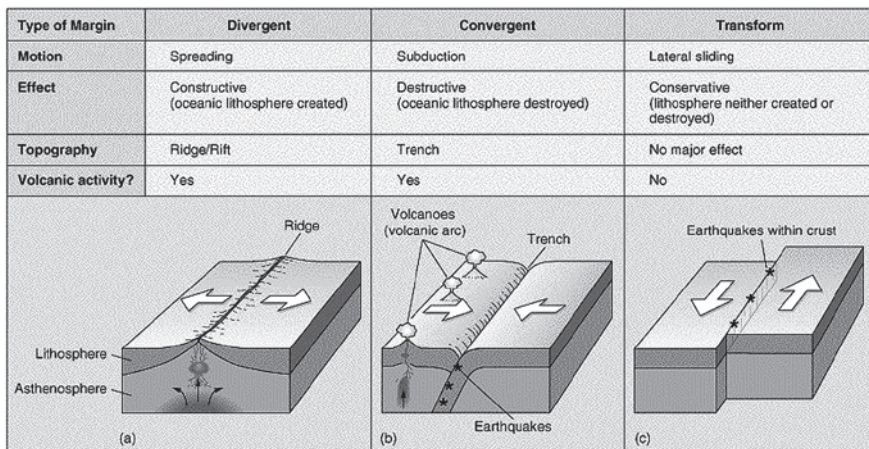


Fig. 3

## **Common Types of Volcanoes**

- **Stratovolcanoes.** They are formed by the accumulation of lavas erupted during multiple eruptions over a long period. The lava in this case is less fluid, and the volcanoes usually have beautiful conic shapes, as exhibited by the Fuji mountain in Japan.
- **Shield volcanoes.** They are formed by lava of higher fluidity. These volcanoes are lower but broader than the Stratovolcanoes, shaped like a shield.
- **Lava domes.** These are dome-shaped up-rises seen in volcanic craters or at their sides. They are formed by lavas that are squeezed out of the magma chambers underneath. The lavas in this case are usually less fluid. Being unable to flow very far, they are solidified near the volcanoes.
- **Cinder cones.** They are formed by the accumulation of volcanic rock pieces and cinders fallen back around the craters. Such conic-shaped volcanoes are highly permeable; any water that falls on them will rapidly flow away; thus they are less eroded. However, being not cemented very well, they are rarely taller than 500 meters.

## **Volcanic Eruptions**

Volcanoes may be grouped into different types according to their eruption styles, which in turn depends on the fluidity, gas content, and the environment of the volcanoes. The fluidity of a lava is higher, if its temperature is higher and its silicon-dioxide content is lower.

When the magma in a volcano has high fluidity but low gas content, the lava tends to flow out slowly without any explosion when erupting. It forms a shield volcano, as seen in Hawaii. When both fluidity and gas content of the magma are high, the lava tends to erupt at a high angle, like a geyser. When both fluidity and gas content are low, the eruption tends to be non-explosive, and the lava tends to flow not far, thus forming a lava dome. When the fluidity is low but the gas content is high, then the eruption tends to be explosive, emitting a large amount of materials, including lava, volcanic ashes and gases, to a high altitude. The larger blocks then fall back and form a cinder cone, while the volcanic ashes may reach a height of as much as 50km in the atmosphere; the finest ashes may follow the jet stream and spread to places as far as one or two thousand kilometers away.

For a volcano located under a deep ocean, where the lava cannot erupt due to the high-pressure and cooling effect of the ocean water, it tends to form some kind of “pillow lava.” For a volcano located in a shallow sea

or lake, where the mixing of lava with ground water produces steam, the eruption tends to be very explosive, like the one seen in the Eyjafjallajökull eruption. Also, during this eruption, part of the overlain glacier was melted, causing a flood that forced more than eight hundred residents to flee.

## **Disasters Caused by Volcanic Eruptions**

During the past 500 years, about 200,000 people were killed by volcanic eruptions. The erupted materials include blocks and particles of different sizes, ashes, steam, and gases (some of them toxic). The finer the particles, the further away they spread, raising safety concerns for airplanes flying over the affected areas as well as destruction when the materials fall back to the ground. The ancient city of Pompeii in Italy was destroyed by the volcanic ashes erupted from the nearby Vesuvius volcano. Some volcanic eruptions triggered the movement of overlying materials, such as soil, rocks, water, and ice on the volcano, and they formed huge mud slides over a large area, burying and destroying many buildings. The 1980 Mount St. Helens eruption in the state of Washington even blew off nearly half of the top of the volcano.

## **What the Government Should Do**

To deal with natural disasters such as volcanic eruptions, the responsible government agencies should have a good disaster-mitigation plan, which includes preparation before their occurrence, emergency response during the occurrence, and various assistance and reconstruction efforts after the occurrence. At the planning stage, the government should make an effort to conduct research and development studies on risk assessment and eruption forecast, to educate the public about disaster mitigation, and to delineate clearly the responsibilities of the different agencies. After a disaster occurrence, the agencies should make timely efforts to rescue the wounded, to maintain a sanitary environment, to properly settle the survivors, and to help effectively the reconstruction in the affected areas.

## **Prediction of Volcanic Eruption**

Prior to eruption, the moving magma under a volcano may cause deformation of the overlying rocks and induce some observable anomalous changes, such as temperature increase, fissure occurrence, increase in seismic activity, emission of underground gases, changes in electromagnetic field, and even minor eruptions. With appropriate monitoring equipment on the ground and in the air, it may be possible to catch some premonitory signals to issue tentative predictions several days before a major eruption. Such predictions

may help the government and residents with taking proper precautionary actions. Historically, successful predictions have been made before the 1980 St. Helens eruption and the 1991 Pinatubo eruption in the Philippines, and they have helped many people escape from the destructions. Prior to the 2010 eruption of the Eyjafjallajökull volcano, small earthquakes increased in number for several months, ground fissures occurred in the edifice, and some minor eruptions occurred for several weeks. These curious phenomena not only attracted quite a few tourists to sightsee the volcano but also helped many residents escape from the disaster in time.

### Benefit of Volcanoes

Although volcanic eruptions often cause serious disasters, they are not without benefits. The erupted materials may increase usable land areas; the added soils are very fertile and thus good for agriculture. The lavas, steam, and other gases are important industrial resources. When ocean water circulates through the mid-ocean ridges, it forms various useful minerals. In places like Iceland, the volcanic-related geothermal energy is an important source of “clean energy.” Theoretically, even the atmosphere and water, on which we all depend for living, may be the result of volcanically-related outgassing of the earth over the long history of the earth.

### Biblical Foresight

The Plate Tectonics theory was established in the 1960s, based on many years of observational and analytical efforts by numerous earth scientists in such fields as seismology, volcanology, oceanic geology, geomagnetism, and geomorphology. The basic idea is simple: The convection of the softer materials inside the earth carry the dozen or more solid plates on the surface to move slowly relative to one another. The essence of this idea, however, had been pointed out a long time ago (about 2,700 years) in the Bible (Isaiah 24:1): **“Behold, the LORD makes the earth empty and makes it waste, distorts its surface and scatters abroad its inhabitants.”** This is one of many cases in which the Biblical statements predate scientific discoveries. Such precedence is not surprising, however, because the Scriptures claim that they are inspired by God, who created all things and knows everything in the universe.

## Chapter 4

# Earthquakes Witness to the Bible

A large earthquake is a major natural disaster that can cause many human deaths and property losses. The world-wide activity of earthquakes varies in both space and time. During the last 50 years, on the average about 13 earthquakes of magnitude 7 or larger have occurred every year—the largest being these: 1952 Kamchatka (magnitude 9.0), 1960 Chile (9.5), 1964 Alaska (9.4), 2004 Indonesia (9.3), and 2011 Japan (9.0). The 2004 Indonesia earthquake even generated a large tsunami that killed more than 300,000 people. In recent years the earthquake activity has increased significantly. During 2010, 22 earthquakes of magnitude 7 or larger occurred, the most damaging being the magnitude 7.0 Haiti earthquake on January 12, which killed more than 200,000 people. The 2011 Japanese earthquake was the largest in the history of Japan; it not only generated a catastrophic tsunami, causing more than twenty-thousand casualties but also damaged several power-generating nuclear reactors, leading to a leak of dangerous radioactive waste materials. During the two-month period prior to this earthquake, five other earthquakes with magnitudes greater than 7 occurred in Japan. In China, the magnitude-8 Wenchuan earthquake that occurred on 12 May 2008 was the most damaging since the disastrous magnitude 7.3 Tangshan earthquake in 1976. In Taiwan, the magnitude-7.3 Chi-Chi earthquake on 21 September 1999 was the largest

and most destructive inland earthquake in Taiwan's history.

Earthquakes are frequently mentioned in the Bible. For example, earthquakes are noted to have occurred during Uzziah's term as the king of Judah (Amos 1:1; Zech. 14:5), at the times of the crucifixion and resurrection of Jesus (Matt.27:51; 28:2), and when Apostle Paul and Silas were imprisoned in Philippi (Acts 16:26). Also, earthquakes are predicted in eschatology (Zech. 14:5; Matt.24:7; Rev. 6:12; 11:13; 16:18). The Bible also has recorded some events that may be related to earthquakes, including the opening of the earth's crust (Num. 16:32), the stop of flow at the Jordan River at Adam (perhaps due to damming caused by an earthquake-induced landslide) (Josh. 3:16), and the collapse of the wall of Jericho (Josh. 6:20).

The reason why earthquakes are mentioned so often in the Bible is that the Holy Land and its surrounding areas are in a seismically active region. The Jordan River valley on the east side of Israel is actually an active geologic fault zone, called The Dead Sea Transform (DST) fault. Historically, major earthquakes have occurred there around 1050 BC, in 31 BC, 363 AD, 749, 1546, and 1927. The 1927 earthquake was measured to be magnitude 6.2; it killed 285 people and injured about 1,000 in Jericho, Jerusalem and many towns and villages within a range of about 100 km. It was recorded by about 100 seismic instruments in Europe, S. Africa and N. America.

Historical records of damages by earthquakes often show similarities to the Biblical description of Jericho's damage at the time of Joshua's attack (1250-1400 BC). According to archeological studies, the wall of Jericho, which is only 2 km from the DST fault and was built about 5,000 years ago, has been rebuilt or replaced at least 16 times, thus suggesting frequent earthquake damage. Earthquake damages may also explain why the ancient wall of Jerusalem has a patchwork appearance, consisting of constructions of different styles and ages.

## **The Cause of Earthquakes**

Why are there earthquakes, or what causes earthquakes? The answer was not clear until 1906, when an earthquake with a magnitude of about 8 occurred in San Francisco. After the earthquake, a 430-km long rupture was observed in the ground along a geological fault, the San Andreas, with a maximum offset of 5 meters in the horizontal direction. Because of the movement

direction being horizontal rather than vertical, a professor, H. F. Reed, realized that the rupture could not have been the result of the earthquake. Instead, it must have been the cause of the earthquake; i.e., the ground shaking was caused by the release of stored elastic energy in the earth as a result of rupturing along this fault segment. His conclusion has since been substantiated by numerous later seismic observations. This “elastic rebound theory” of how earthquakes are normally generated was discovered only slightly more than 100 years ago.

However, the causal relationship between earthquakes and fault ruptures has been hinted in a passage of the Bible written around 500 BC, or 2,500 years ago already: **“On that day his feet will stand on the Mount of Olives, east of Jerusalem, and the Mount of Olives will be split in two from east to west, forming a great valley, with half of the mountain moving north and half moving south. You will flee by my mountain valley, for it will extend to Azel. You will flee as you fled from the earthquake in the days of Uzziah, king of Judah. Then the Lord my God will come, and all the ones with him.”** (Zech. 14:4-5) This prophetic statement not only describes Christ’s second coming as being accompanied by at least an earthquake but also points out that this earthquake is to be caused by a strike-slip movement (possibly along the DST fault or a branch fault) on the east side of Israel, just like the case of the 1906 San Francisco earthquake, being caused by such a movement along the San Andreas fault. The causal relation is described clearly also: fault movement before the earthquake. It is interesting to note that after the aforementioned 1927 earthquake in the Holy Land, an offset of 50 cm was actually observed along the DST fault, and chunks of mud were found to have slid into the Jordan river near Damiya (which is the ancient Adam mentioned in the book of Joshua) about 40 km north of Jericho, causing a temporary reduction in the river flow. Similar flow interruptions were observed in 1906, 1834, 1534, 1267, and 1160 as well.

## Plate Tectonics Theory

Why is there fault movement, then? The answer to this question came in the 1960s when the theory of Plate Tectonics was developed. According to this theory, the earth’s surface layer (the lithosphere) is neither a whole piece nor stationary, but consists of a dozen or more huge plates floating on and carried by a hotter and softer convecting “asthenosphere” below in a slow

relative motion of several cm per year. At the plate boundaries, which are large and deep geological faults, the motion is resisted by friction, until a portion of it is overcome by the accumulated stress; then a sudden offset occurs there and produces an earthquake. The size of the earthquake is determined by the dimension of the rupture and the amount of offset. This theory, though simple in concept, did not come easily; it was obtained through many substantial long-term efforts in various scientific disciplines, including seismology, paleo-geomagnetism, and ocean-bottom geophysics. It was considered to be a revolutionary discovery in earth science. Yet the basic idea had been pointed out already in a Biblical statement made around 700 BC: **“Behold, Jehovah makes the land empty, and makes it waste, and turns it upside down, and scatters abroad its inhabitants.”** (Isa. 24:1, Darby’s translation). This simple statement not only tells us that the earth’s surface is moving (to scatter the inhabitants) but also points out the mechanism, namely, mantle convection (turns it upside down). This statement preceded the scientific discovery of Plate Tectonics by about 2,700 years!

Part of the Plate Tectonics Theory is based on the observation that the crust under the oceans is newer than the continental crust. This is due to the process of “sea-floor spreading” with new materials continually coming up to the sea-floor surface at the mid-ocean ridges. This crustal-renewal idea is also preceded by the Biblical statement: **“When you send your spirit, they are created, and you renew the face of the earth,”** which was written probably about 3,000 years earlier, (Psa. 104:30).

## The Earth and Its Atmosphere

The knowledge that the earth is approximately a sphere was proven scientifically some 500 years ago. But this had been pointed out in the book of Isaiah written about 2,700 years ago: **“Do you not know? Have you not heard? Has it not been told you from the beginning? Have you not understood since the earth was founded? He (God) sits enthroned above the circle of the earth, and its people are like grasshoppers. He stretches out the heavens like a curtain, and spread them out like a tent to live in.”** (40:21-22) Here the word “circle” in the original Hebrew language can be also translated as “sphere”; thus clearly indicating the earth being a sphere. Isaiah served as a prophet during around 740-680 BC; he was earlier than the Greek philosophers who also inferred the earth being spherical in shape

in the 6th century BC, and much earlier than the around-the-earth expedition during 1519-22 that actually confirmed this fact. In the above-mentioned passage, Isaiah not only talked about the earth, but also the sky (the heavens), which we now know to be the earth's atmosphere. In comparison with the earth itself, the atmosphere is relatively thin and rarefied, and is thus like a curtain (from God's point of view in space), just as he described. In addition, he described the atmosphere as a tent to dwell in, i.e., it provides protection for the inhabitants. What kinds of protection does the atmosphere provide? The ozone component in the air shields people against ultraviolet light, which may cause skin cancer and cataracts if overexposed; and the whole atmosphere provides a shield against meteorite/asteroid impacts which can cause mass destruction on earth. In addition, the earth has a magnetic field, which provides a shield against solar wind and cosmic rays, as discussed in Chapter 10.

## The Foundation of the Earth

In the same paragraph of Isaiah, a question is raised about the foundation of the earth. Everything on earth needs a foundation for support, but where is the foundation of the earth? The answer to this simple question was not so obvious in ancient times, but a Bible verse possibly written about 4,000 years ago states: **"He (God) ... hangs the earth on nothing."** (Job 26:7) This statement, which must have been considered absurd by the ancient peoples, turns out to be true and understandable after Newton's discovery of gravity and the laws of motion. Since Newton, we know that the earth, being revolving around the sun, is subject to a centrifugal force which is balanced by the centripetal force due to gravitational attraction to the sun; thus, it is in a dynamic equilibrium without falling to anywhere.

The above-mentioned examples illustrate the superiority of Biblical wisdom to human wisdom, and support the Bible's claim that it is inspired by God (2 Tim. 3:16). The Bible, in turn, bears witness to Jesus Christ, who is the Son of God but became a man to be the Savior of the world (Jhn. 3:16).

### Quoted Scriptures:

**Amos 1:1:** "The words of Amos, who was among the herdsmen of Tekoa, which he saw concerning Israel in the days of Uzziah king of Judah, and in the days of Jeroboam the son of Joash, king of Israel, two years before the earthquake."

**Zechariah 14:5:** "Then you shall flee through My mountain valley, for the mountain valley shall reach to Azal. Yes, you shall flee as you fled from the earthquake in the days of Uzziah king of Judah. Thus the LORD my God will come, and all the saints with You."

**Matthew 27:51:** "And behold, the veil of the temple was torn into two from top to bottom; and the earth quaked, and the rocks were split."

**Matthew 28:2:** "And behold, there was a great earthquake; for an angel of the Lord descended from heaven, and came and rolled back the stone from the door, and sat on it."

**Acts 16:26:** "Suddenly there was a great earthquake, so that the foundations of the prison were shaken; and immediately all the doors were opened and everyone's chains were loosed."

**Matthew 24:7:** "For nation will rise against nation, and kingdom against kingdom. And there will be famines, pestilences, and earthquakes in various places."

**Revelation 6:12:** "I looked when He opened the sixth seal, and behold, there was a great earthquake; and the sun became black as sackcloth of hair, and the moon became like blood."

**Revelation 11:13:** "In the same hour there was a great earthquake, and a tenth of the city fell. In the earthquake seven thousand men were killed, and the rest were afraid and gave glory to God of heaven."

**Revelation 16:18:** "And there were noises and thunderings and lightnings; and there was a great earthquake, such a mighty and great earthquake as had not occurred since men were on the earth."

**Numbers 16:32:** "And earth opened its mouth and swallowed them up, with their household and all the men with Korah, with all their goods."

**Joshua 3:16:** "...that the water which came down from upstream stood still, and rose in a heap very far away at Adam, the city that is beside Zaretan..."

**Joshua 6:20:** "So the people shouted when the priests blew the trumpets. And it happened when the people heard the sound of the trumpet, and the people shouted with a great shout, that the wall fell down flat...."

**Psalm 104:30:** "You send forth your Spirit, they are created; and you renew the face of the earth."

**2 Timothy 3:16:** "All Scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness."

**John 3:16:** "For God so loved the world that He gave His only begotten Son, that whoever believes in Him should not perish but have everlasting life."

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## Chapter 5

# Science and the Bible

In a previous article (1), it is mentioned that both science and the Bible emphasize facts and truths but condemn falsehood and superstition; they are different in pre-suppositions, realms of concern, the ways information is acquired, and the participating researchers/authors.

Regarding presuppositions, science has tacitly been based on atheism and materialism (including energy), while the Bible on Christian theism that there is an omnipotent, omnipresent, omniscient, everlasting God, who is the creator of all things, both spiritual and physical, and who ordained and is maintaining the order and laws in the universe. Since it is beyond scientific proof whether God exists or not, either presupposition has to be accepted by faith.

Regarding realms of concern, science investigates the physical universe in hope of discovering the natural laws that govern its normal operation. On the other hand, the all-inclusive Bible touches on all aspects of life, both physical and spiritual, including God Himself; its main purpose is to convey God's message of saving mankind and the whole creation from the current fallen condition, back to what God intended at the beginning. It deals not only with ordinary things that obey the natural laws, but also extraordinary things or so-called miracles, including Christ's birth by a virgin and His resurrection. Such extraordinary things are not conceivable under the presupposition of atheism but are entirely reasonable under the presupposition of

Biblical theism. Because it is God who ordained the rules, of course He can break the rules as He sees fit, by doing certain transcendental “new” things as a sign of His intervention into world affairs (Jhn. 20:30-31).

Regarding sources of information and participants, scientific knowledge has been acquired solely by human efforts in an ongoing and never-ending process of observation and logical thinking. Since human abilities are limited, their scientific conclusions (i.e., theories and laws) are approximate, tentative, and limited in their scope of applicability, and always subject to change when demanded by new observations. The Scriptures, on the other hand, were not only written by human authors but also claimed to be inspired by God (2 Tim. 3:16; 2 Pet. 1:21), thus having both human and divine natures. Since God is the creator and is omniscient, it is reasonable to believe that the Biblical truths He inspired are not like the scientific conclusions, but are inerrant, absolute, and everlasting (Jhn. 17:17; Psa. 119:89; 1 Pet. 1:25; Mrk. 13:31). Thus, when certain scientific conclusions appear to have contradicted some Biblical statements, one should not automatically jump to the conclusion that such statements are unscientific and thus wrong, but should examine whether they have been incorrectly interpreted, and whether the scientific conclusions are really valid. In two previous articles (2) and (3) on Earthquakes and God’s Creation, I have shown that some Biblical statements have not only foreseen certain scientific conclusions but also given better explanations.

Since science and the Bible are not entirely different in content, since both emphasize facts and truths, and since both have unproven presuppositions which must be accepted by faith, any contradicting statements between the two should be examined objectively in search of truths. The science-related statements in the Bible should not be excluded categorically from the curriculum of schools in the name of “separation of science and religion.” When teaching the origin of mankind, for example, schools should not forbid the mentioning of the possibility of creation, while teaching the theory of evolution.

If Biblical statements may transcend physical laws such as those found in biology and chemistry, one might wonder whether they might transcend mathematical laws also. Yes, from the Biblical doctrines of “Trinity” and the “dual nature of Jesus Christ” we know that indeed they may. Mathematically, Trinity may be expressed as “ $1+1+1=1$ ” and Christ’s dual nature as “ $1+1=1$ ”. These equations are impossible in the realm of the created physical universe, but not impossible for God, who is spiritual and transcends this realm. With such realization, we no more have to resort to certain analogy, such as “water, steam, and ice,” to illustrate the concept of Trinity. Regarding the question

of “dual nature,” if physical light can be both particle and wave, why cannot Jesus, “the true light” (Jhn. 1:9; 9:5), be both God and man?

Another fundamental principle that God transcends is Causality which was revealed by His declaration “I am.” (Exo. 3:14a), meaning He exists by Himself from everlasting to everlasting! His is not only the first cause of everything, but also the final end of all things. (Eph. 1:10; Reve.22:13)

### Quoted Scriptures :

**John 20:30-31:** “And truly Jesus did many other signs in the presence of his disciples, which are not written in this book; but these are written that you may believe that Jesus is the Christ, the Son of God, and that believing you may have life in His name.”

**2 Timothy 3:16:** “All Scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness.”

**2 Peter 1:21:** “for prophecy never came by the will of man, but holy men of God spoke as they were moved by the Holy Spirit.”

**John 14:6:** “Jesus said to him: ‘I am the way, the truth and the life. No one comes to the Father except through me.’”

**John 17:17:** “Sanctify them by Your truth. Your word is truth.”

**Psalms 119:89:** “Forever, O Lord, Your word is settled in heaven.”

**1 Peter 1:25:** “but the word of the Lord endures forever.”

**Mark 13:31:** “Heaven and earth will pass away, but my words will by no means pass away.”

**John 1:9:** “That was the true Light which gives light to every man who comes into the world.”

**John 9:5:** “As long as I am in the world, I am the light of the world.”

**Exodus 3:14a :** God said to Moses, “I AM WHO I AM.”

**Ephesians 1:10 :** That in the dispensation of the fullness of times he might gather together in one all things in Christ, both which are in heaven, and which are on earth; even in him:

**Revelation 22:13 :** I am Alpha and Omega, the beginning and the end, the first and the last.

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1. “Science and Christian faith: Are they mutually exclusive or contradictory?” *Great Commission News*, Summer 2006.
2. “Earthquakes witness to the Bible”, *Great Commission News*, Winter 2011.
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## Chapter 6

# Geophysical Phenomena at Jesus' Second coming

The Bible has repeatedly predicted Jesus' second coming and described various events that will happen when He comes, including some geophysical disasters: huge earthquakes; earth movement along geologic faults, such as the Dead Sea Transform Fault east of Jerusalem (Ref. 1 and Ch. 4); displacement of mountains and islands; shaking of heavens; global-scaled fire and smoke; thundering and lightening; darkening of sun and other heavenly bodies; the moon becoming reddish; stars falling down like figs to the ground; a burning mountain falling into sea; a great star falling from heaven; turbulent sea waves; and rivers and spring waters becoming non-potable (Isa. 13: 10, 13; Joel 2:10, 30-32; 3:14-15; Zech. 14:4-5; Matt. 24:29; Luk. 21:25-28; Rev. 6:12-14; 8:5-12).

The descriptions of these geophysical events are probably not symbolic in nature, but about actual happenings. They are probably not about individual events either, but about related phenomena that are triggered by a rare massive event—namely, high-speed impact of meteoroids, asteroids, and/or comets with the earth.

There are many near-earth solid fragments in space, including meteoroids and asteroids, that are falling down to the earth continuously but usually

in relatively small sizes. Most of these falling fragments are broken up and destroyed in the atmosphere during the transit, producing light and sound that can be seen or heard occasionally by people nearby. Some larger ones reach the Earth's surface as meteorites. Some still larger ones have even made some large impact craters on the ground. So far about 170 such craters have been discovered on earth, the largest being about 300 km in diameter .

In addition, once every many millions of years, the earth may encounter a super-scaled impact event brought about by many large meteoroids, asteroids, and/or comets. When they enter the earth's atmosphere at high speed, they do not only break up, generating loud noises, smoke, and fragments of different sizes, but also impact the land/water areas, splashing huge amounts of water, dust, and rock pieces into the atmosphere. Some impacts may even trigger volcanic eruptions, spewing out lava, rocks, smoke, and ashes into the upper atmosphere. Others impacts may trigger earth movement along geologic faults that are at the brink of rupture, resulting in large earthquakes. If the earthquakes occur in ocean, it may possibly trigger a tsunami as well. All these geophysical events may damage not only personal lives and properties, but also industrial facilities, such as nuclear reactors and oil refineries. They may also cause forest fires at a global scale, resulting huge amounts of smoke, moisture, and debris in the atmosphere, blocking the sunlight for a long period of time, preventing photosynthesis, and causing a long-term temperature drop, thus rendering the earth uninhabitable and causing mass extinction.

According to paleontological studies, five episodes of mass extinction and many more smaller ones have occurred in the earth's long history. The last one occurred about 65 million years ago, and it involved the extinction of dinosaurs. The most likely cause for this extinction is believed to be an impact event involving an asteroid/comet as large as 10 km in dimension, possibly falling in the southern near-coast area of the Gulf of Mexico. It created a crater about 170 km wide and released an amount of energy equivalent to a magnitude-13 earthquake, which is about one million times larger than that of the magnitude-9 earthquake in Japan on 11 March 2011.

The Bible describes the condition of the earth before the six-day creation of this world as: **“The earth was without form, and void, and darkness was on the face of the deep.”** (Gen. 1:2) And the atmosphere was filled

with water/moisture until God divided the water to make the firmament on the second day (Gen. 1:6). In a previous article (Ref. 2 and Ch. 2), I argued that this initial condition of large amounts of water in the air prior to the present world was probably due to a huge meteoroid/asteroid impact event occurring in some oceanic areas, which might be the means by which God destroyed the previous world.

The Bible has stated that God will destroy the present world by fire (2 Pet. 3:10-12) when Jesus comes again. From the descriptions listed in the first paragraph, it seems that He will use the same physical process, namely, a massive impact event, involving at least a huge asteroid and many meteoroids. This time the impact may possibly occur in some land area, causing the fire-related catastrophe.

The reasons for God destroying both worlds are the same, i.e., to wipe out sin. The extent of the future destruction, like the past one, will probably not be the entire planet earth, but limited to the earth's surface and atmosphere, because that is where sin and the evil spirits exist. This may be why the Bible uses the analogy of a cloak, garment, or scroll to describe the future destruction (Psa. 102:25-27; Isa. 34:4; Heb. 1:12; Rev. 6:14).

This destruction is in preparation for God's making "the new heavens and a new earth" after the Millennium Kingdom and the Last Judgment (Isa. 65:17; Rev. 20:6, 11-15; 21:1), where the resurrected saints will dwell in righteousness and glory with God forever. This is the glorious hope of all true Christians after their bodily resurrection or rapture. Thus, ultimately, God will overcome all of Satan's rebellious activities, and accomplish God's original purpose of creating man in His image to rule over the orderly and harmonious new earth for Him.

Having this understanding, we might ask: How should we lead our lives in this world? For non-believers, apostle Peter quoted Joel 2:30-32 in his first recorded gospel message on the day of Pentecost to urge the people in the audience **"to call on the name of the Lord to be saved"** (Acts 2:21). For Christians, he wrote in 2 Peter 3:10-12: **"Therefore since all these things will be dissolved, what manner of persons ought you to be in holy conduct and godliness, looking for and hasting the coming of the day of God."** Let us take heed of these important messages.

**Quoted Scriptures:**

**Isaiah 13:10 and 13:** "For the stars of heaven and their constellations will not give their light; the sun will be darkened in its going forth, and the moon will not cause its light to shine. [...] Therefore I will shake the heavens, and the earth will move out of its place, in the wrath of the Lord of hosts and in the day of His fierce anger."

**Joel 2:10, 30-32:** "The earth quakes before them, the heavens tremble; the sun and moon grow dark, and the stars diminish their brightness. [...] And I will show wonders in the heavens and in the earth: blood and fire and pillars of smoke. The sun shall be turned into darkness, and the moon into blood, before the coming of the great and terrible day of the Lord. And it shall come to pass that whoever call the name of the Lord shall be saved."

**Joel 3:14-15:** "Multitude, multitudes in the valley of decision! For the day of the Lord is near in the valley of decision. The sun and moon will grow dark, and the stars will diminish their brightness."

**Zechariah 14:4-5:** "And in that day His feet will stand on the Mount of Olives, which faces Jerusalem on the east. And the Mount of Olives shall be split into two, from east to west, making a very large valley; half of the mountain shall move toward the north and half of it toward the south. Then you shall flee through my mountain valley, for the mountain valley shall reach to Azal. Yes, you shall flee as you fled from the earthquake in the days of Uzziah king of Judah."

**Matthew 24:29:** "Immediately after the tribulation of those days the sun will be darkened, and the moon will not give its light; the stars will fall from heaven, and the powers of the heavens will be shaken."

**Luke 21:25-28:** "And there will be signs in the sun, in the moon, and in the stars; and on the earth distress of nations, with perplexity, the sea and the waves roaring; men's hearts failing them from fear and the expectations of those things which are coming on the earth, for powers of heaven will be shaken. Then they will see the Son of Man coming in a cloud with power and great glory. Now when these begin to happen, look up and lift up your head, because your redemption draws near."

**Revelation 6:12-14:** "I looked when He opened the sixth seal, and behold, there was a great earthquake; and the sun became black as sackcloth of hair, and the moon became red like blood. And the stars of heaven fell to the earth, and a fig tree drops its late figs when it is shaken by a mighty wind. Then the sky receded as a scroll when it is rolled up, and every mountain and island was moved out of its place."

**Revelation 8:5-12:** "Then the angel took the censer, filled it with fire from the altar, and threw it to the earth. And there was noises, thunders, lightnings, and earthquake. So the seven angels who had the seven trumpets prepared themselves to sound. The first angel sounded: And hail and fire followed, mingled with blood, and they were thrown to the earth; and a third of the trees were burned up, and all green grass was burned up. Then the second angel sounded: And something like a great mountain burning with fire was thrown into the sea, and a third of the sea became blood; and a third of the living creatures in the sea died, and a third of the ships were destroyed. Then the third angel sounded: And a great star fell from heaven, burning like a torch, and fell on a third of the rivers and on the springs of water; and the name of the star is Wormwood; and a third of the waters became wormwood; and many men died from the water, because it was made bitter. Then the fourth angel sounded: And a third of the sun was struck, a third of the moon, and a third of the stars, so that a third of them were darkened; and a third of the day did not shine, and likewise the night."

**Psalms 104:5:** "You who laid the foundations of the earth, so that it should not be moved forever."

**Psalms 119:90:** "Your faithfulness endures to all generations; you established the earth, and it abides."

**Ecclesiastes 1:4:** "One generation passes away, and another generation comes; but the earth abides forever."

**2 Peter 3:10-12:** "But the day of the Lord will come as a thief in the night, in which the heavens will pass away with a great noise, and the elements will melt with fervent heat; both the earth and the works that are in it will be burned up. Therefore, since all these things will be dissolved, what manner of persons ought you to be in holy conduct and godliness, looking for and hastening the coming of the day of God, because of which the heavens will be dissolved being on fire, and the elements will melt with fervent heat?"

**Psalms 102:25-27:** "Of old you laid the foundation of the earth, and the heavens are the work of your hands. They will perish, but you will endure; yes all of them will grow old like a garment; like a cloak you will change them, and they will be changed. But you are the same, and your years will have no end. The children of your servants will continue, and their descendants will be established before you."

**Isaiah 34:4:** "All the host of heaven shall be dissolved, and the heavens shall be rolled up like scroll; all their host shall fall down as the leaf falls from the vine, and as fruit falling from a fig tree."

**Hebrews 1:12:** "Like a cloak you will fold them up, and they will be changed. But you are the same, and your years will not fail."

**Revelation 6:14:** "Then the sky receded as scroll when it is rolled up, and every mountain and island was moved out of its place."

**Isaiah 65:17:** "For behold, I create new heavens and a new earth; and the former shall not be remembered or come to mind."

**Revelation 20:6:** "Blessed and holy is he who has part in the first resurrection. Over such the second death has not power, but they shall be priests of God and of Christ, and shall reign with him a thousand year."

**Revelation 20:11-15:** "Then I saw a great white throne and him who sat on it, from whose face the earth and the heaven fled away. And there was found no place for them. And I saw the dead, small and great, standing before God, and books were opened. And another book was opened, which is the Book of Life. And the dead were judged according to their works, by the things which were written in the books. The sea gave up the dead who were in it, and Death and Hades delivered up the dead who were in them. And they were judged, each one according to his works. The Death and Hades were cast into the lake of fire. This is the second death. And anyone not found written in the Book of Life was cast into the lake of fire."

**Revelation 21:1:** "And I saw a new heaven and a new earth, for the first heaven and the first earth had passed away. And there was no more sea."

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## Chapter 7

# Geophysical Phenomena at Jesus' Death and Resurrection

The Bible has mentioned certain geophysical phenomena that occurred at the time of Jesus' crucifixion, such as darkness over all the earth, the sun being darkened, an earthquake, and rock splits (Luk. 23:44-46; Matt. 27:45, 50-51).

From the Biblical description, the earthquake does not seem to be triggered by another event, such as a meteoroid impact, but was probably an ordinary plate-tectonic event, like most other earthquakes. Earthquake occurrence in Jerusalem is not surprising, for Israel is an earthquake country, located on the west side of an active geologic structure, the Dead Sea Transform Fault, which basically coincides with the Jordan River. Neither does this earthquake seem to be an isolated event, but was probably a “foreshock” of the main shock, which occurred three days later when Jesus resurrected (“a great earthquake,” Matt. 28:1-2). Also an “aftershock” occurred about two months later, when the church was praying in Jerusalem, after Peter and John were arrested and then released by the Sanhedrin (Acts 4:31).

As to the phenomenon of the darkness of the sun and over the earth, it still defies a reasonable scientific explanation. It could not have been due to solar eclipse, for Jesus was crucified on Passover day, around the middle of

a lunar month when the sun and moon were on opposite sides of the earth; thus the moon could not have blocked the sunshine on earth. Neither has the Bible recorded any other event that might be construed as having blocked the sunlight. Also Luke, being a physician/scientist, was careful about the order of occurrences, when stating that “there was darkness over all the earth” and “then the sun was darkened.” Thus it appears that this darkness was not a natural event, but some special act of God (i.e., a miracle), in order to achieve certain purpose.

What is this purpose, then? One possibility is to fulfill the seemingly contradictory predictions made by Jesus about the time interval between His death and resurrection. On one occasion, Jesus predicted that “**on the third day**” He would rise again (Matt. 20:19; Luk. 9:22). On another, “**after three days**” (Mrk. 8:31). On an earlier occasion, He used Jonah as a type to indicate that he would be “**three days and three nights in the heart of the earth**” (Matt. 12:38-40). The difference between “the third day” and “after three days” is probably not significant, because the Jews commonly regarded “part of a day” as “a day.” But both of these statements are obviously different from “three days and three nights.” If we calculate that time interval with the understanding that a day begins at sunset rather than midnight, then the actual period of Jesus’ death was only “three days and two nights,” between 3pm on Friday (when the three-hour darkness was about to end) and sunrise on Sunday. However, the missing night is symbolically made up by this darkness period. Thus, it seems that Jesus has not only accurately predicted the time interval between His death and resurrection, but also symbolically included this darkness occurrence in His earlier prediction.

Another possible purpose of God for this darkness event is that it is relevant to the salvation history in the Bible. Two similar darkness events are recorded earlier in the Old Testament. One of them is given in Genesis 15:12, “**horror and great darkness fell on him** (Abram, later renamed Abraham)” at the time when Abraham made a sacrifice; the other in Exodus 10:22, “**there was thick darkness in all the land of Egypt three days,**” at the Passover time. In the first case, after Abraham encountered the darkness, God made a covenant with him on that very day (Gen. 15:18). This covenant, with some later clarifications and amplifications, was mainly concerned with his descendants (especially Jesus), the Promised Land, and the principle of justification by faith. In the second case, the darkness was followed by the in-

stitution of Passover and then the beginning of Israel's exodus out of Egypt. In both events, the sacrifices are probably types of Jesus, who being the true Passover lamb of God, would be sacrificed to save His people out of darkness into light (1 Cor. 5:7; Heb. 10:11-14). Since His salvation was for all the people in this "dark" world, it may be why the darkness at the time of His crucifixion covered all the earth.

### Quoted Scriptures

**Luke 23:44-46:** "And it was about the sixth hour, and there was darkness over all the earth until ninth hour. Then the sun was darkened, and veil of the temple was torn into two. And when Jesus had cried out with a loud voice, He said, 'Father, into your hands I commend my spirit.' And having said this, He breathed his last."

**Matthew 27:45, 50-51:** "Now from the sixth hour until the ninth hour there was darkness over all the land. [...] Jesus, when He had cried out again with a loud voice, yielded up His spirit. And behold, the veil of the temple was torn in two from top to bottom; and the earth quaked, and rocks were split."

**Matthew 28:1-2:** "Now after sabbath, as the first day of the week began to dawn, Mary Magdalene and the other Mary came to see the tomb. And behold, there was an earthquake; for an angel of the Lord descended from heaven, and came and rolled back the stone from the door, and sat on it."

**Acts 4:31:** "And when they had prayed, the place where they were assembled together was shaken; and they were all filled with the Holy Spirit, and they spoke the word of God boldly."

**Matthew 20:19:** "...and deliver Him to the Gentiles to mock and to scourge and to crucify. And the third day He will rise again."

**Luke 9:22:** "The Son of Man must suffer any things, and be rejected by the elders and chief priests and scribes, and be killed, and be raised the third day."

**Mark 8:31:** "And He began to teach them that the Son of Man must suffer many things, and be rejected by the elders and chief priests and scribes, and be killed, and after three days rise again."

**Matthew 12:38-40:** "Then some of the scribes and Pharisees answered, saying, 'Teacher, we want to see a sign from you.' But He answered and said to them, 'An evil and adulterous generation seeks after a sign, and no sign will be given to it except the sign of the prophet

Jonah. For as Jonah was three days and three nights in the belly of the great fish, so will the Son of Man be three days and three nights in the heart of the earth."

**Genesis 15:12:** "Now when sun was going down, a deep sleep fell upon Abram; and behold horror and great darkness fell upon him."

**Exodus 10:22:** "So Moses stretched out his hand toward heaven, and there was thick darkness in all the land of Egypt three days."

**Genesis 15:18:** "On the same day the LORD made a covenant with Abram, saying, 'To your descendants I have given this land, from the river of Egypt to the great river, the River Euphrates.'"

**1 Corinthians 5:7:** "Therefore, purge out the old leaven, that you may be a new lump, since you truly are unleavened. For indeed Christ, our Passover, was sacrificed for us."

**Hebrews 10:11-14:** "And every priest stands ministering daily and offering repeatedly the same sacrifices, which can never take away sins. But this Man, after He had offered one sacrifice for sins forever, sat down at the right hand of God, from that time waiting till His enemies are made His footstool. For by one offering He has perfected forever those who are being sanctified."

## Chapter 8

# To Fathom “the Infinite” with “the Finite”

Biblical facts and truths may transcend scientific conclusions, not only in such fields as physics and chemistry but also in mathematics. The most obvious cases are the Trinity and Christ’s dual nature (being both God and man). Trinity may be mathematically expressed as “ $1 + 1 + 1 = 1$ ,” and Christ’s dual nature, “ $1 + 1 = 1$ .” These results are, of course, mathematically incorrect, and this may be why many people have difficulty in accepting these fundamental Biblical truths.

In the above-mentioned equations, both God and man are represented by 1. A more appropriate representation of God, however, is infinity (usually denoted by  $\infty$  rotated 90°, but here by I), because, according to the Bible, God is infinitely great in space, time, and His attributes (omnipresence, everlasting, omnipotence, omniscience, etc.).

Thus, the proper equation to express Trinity should be “ $I + I + I = I$ ” (infinity + infinity + infinity) = infinity, and the dual nature of Christ, “ $I + 1 = I$ ” (infinity + 1 = infinity). Both of these equations are mathematically correct, showing that both Trinity and Christ’s dual nature are rationally acceptable. Thus, to understand Trinity and Christ’s dual nature, there is no need to resort to such analogies as the three phases of  $H_2O$  (water, ice, and steam) and

the dual nature of light. In other words, Trinity and Christ's dual nature are corollaries, or necessary conclusions, of the fact that God is infinitely great. With this understanding, many other Biblical concepts will become comprehensible also, including God's self-existence. Such existence transcends the causality rule, which applies only to the finite creation of God, not to the infinite God Himself.

Our difficulty in understanding the Scriptures is often due to using our "finite" minds and senses to fathom the "infinite" God, His words, and His doings, include many miracles recorded in the Bible. Mathematically, any finite number, no matter how big, amounts to zero if compared with infinity. Likewise, all great scientists, philosophers, or religious leaders, no matter how wise they are, are not enough to thoroughly comprehend the infinite God, His saying, and His doings.

To fathom the "infinite" without being aware of our "finiteness" or "limitedness" is the basic reason why we human beings have made and are still making so many mistakes in matters regarding God! It would be wiser for us to humbly listen to what the omniscient God Himself has to say in the Scriptures:

**Exodus 3:14:** And God said to Moses: "I am who I am (implying self and eternal existence)."

**Job 9:10:** He does great things past finding out, yes, wonders without number.

**Job 42:1-3:** Then Job answered the Lord and said: "I know that You can do everything, and that no purpose of Yours can be withheld from You. You asked 'who is this who hides counsel without knowledge?' Therefore, I have uttered what I did not understand, things too wonderful for me, which I did not know.

**Psalms 33:10-11:** The Lord brings the counsel of the nations to nothing; He makes the plans of the peoples of no effect. The counsel of the Lord stands forever, the plans of His heart to all generations.

**Psalms 90:2:** Before the mountains were brought forth, or ever You had formed the earth and the world, even from everlasting to everlasting, You are God.

**Psalms 102: 25-27:** Of old You laid the foundation of the earth, and the heavens are work of your hands. They will perish, but You will endure. Yes, all of them will grow old like a garment; like a cloak You will change

them, and they will be changed. But You are the same, and Your years will have no end.

**Psalm 119:89:** Forever, O Lord, Your word is settled in heaven.

**Psalm 139:6:** Such knowledge is too wonderful for me; it is high, I cannot attain it.

**Psalm 145:3:** Great is the Lord, and greatly to be praised; and His greatness is unsearchable.

**Psalm 147:5:** Great is our Lord, and mighty in power; His understanding is infinite.

**Isaiah 40:28:** The everlasting God, the Lord, the Creator of the ends of the earth, neither faints nor is weary. There is no searching of His understanding.

**Isaiah 44:6:** Thus says the Lord, the King of Israel, and his Redeemer, the Lord of hosts, "I am the first and I am the last; besides Me there is no God."

**Isaiah 46:10:** "declaring the end from the beginning, and from ancient times things that are not yet done, saying, 'My counsel shall stand, and I will do all My pleasure.'"

**1 Peter 1:24-25:** Because "All flesh is as grass, and all the glory of man as the flower of the grass. The grass withers, and the flower falls away, but the word of the Lord endures forever." Now this is the word which by the gospel was preached to you.

**Revelation 22:3:** "I am the Alpha and I am the Omega, the Beginning and the End, the First and the Last."

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## Chapter 9

# “God Particle”

Scientific knowledge is known to be limited, and scientists have been constantly striving to improve the understanding of the nature of the physical universe, and to expand their knowledge frontiers. Physicists in particular have been trying to search for the truths at the two extremes of the scale of the universe: cosmologists about the entire vast universe, while particle physicists about the tiniest fundamental constituents of matter.

According to the prestigious magazine *Science*, the most significant scientific discovery or “breakthrough” of 2012 was the Higgs Boson, which is also known incidentally as the “God particle.” The discovery of this particle, announced on July 4, 2012, was made at the site of the world’s largest atom smasher --- the Large Hadron Collider (LHC) in Switzerland. It is thought to be the last missing piece in physicists’ standard model of fundamental particles and forces. This model assumes that there is a field permeates the universe that gives energy to vacuum and mass to certain fundamental particles but not to others. The theoretical basis of this discovery was laid by two physicists, Francois Englert and Peter W. Higgs, independently in 1964. After half century, Englert passed away and Higgs finally received the 2013 Nobel prize in physics.

The “God particle,” though incidentally named, may serve to remind

us of God's existence everywhere, including the farthest edge of the physical universe (and beyond) and at the most fundamental level of matters, for He is both infinitely great and infinitesimally small.

In a previous article<sup>1</sup>, I discussed some implications of God being infinitely great. Let us now consider His being infinitesimally small, a truth which has drawn less attention from Christians and non-Christians alike. His being infinitesimally small, though not mentioned directly in the Bible, is implied by His omniscience, omnipresence (Psa. 139:7-9; Jer. 23:24), omnipotence (Matt. 19:26), and His being the creator and upholder of all things, great or small (Rom. 1:20; Heb.1:3).

In so being, He can name all the numerous stars in the vast universe (Psa. 147:4; Isa. 40:26) and at the same time take care of a single sparrow and count the number of hairs of each and every person (Matt. 10:29-31). He is with every tiny piece of material, even the tiniest fundamental particles, like the "God particle", and whatever may be more fundamental that may be discovered in the future.

One interesting and important feature of His being infinitesimally small is that, like His being infinitely great, it is mathematically consistent with the Biblical truths of Trinity and Jesus' God-man dual nature. For if we use  $i$  to denote His being infinitesimally small, then Trinity may be expressed as  $i + i + i = i$ , and the duality as  $i + 1 = 1$ , which are both mathematically correct. God being unlimited at both extremes of the scale explains why He transcends mathematical truths that apply only to finite numbers, and why we as His people, whom He loves, should never fear under any circumstance.

### Quoted Scriptures

***Psalms 139:7-9:*** "Where can I go from Your Spirit? Or where can I flee from your presence? If I ascend into heaven, you are there; if I made bed in hell, behold, You are there. If I take the wings of the morning, and dwell in the uttermost parts of the sea, even there Your hands shall lead me. And Your right hand shall hold me."

***Jeremiah 23:24:*** "'Can anyone hide himself in secret places, so I shall not see him?' Says the LORD; 'do I not fill heaven and earth?' says the LORD."

***Romans 1:20:*** "For since the creation of the world His invisible attributes are clearly seen, being understood by the things that are made,

even His eternal power and Godhead, so that they are without excuse.”

**Hebrews 1:3:** “Who being the brightness of His glory and the express image of His person, and upholding all things by the word of His power....”

**Psalms 147:4:** “He counts the number of the stars; He calls them all by name.”

**Isaiah 40:26:** “Lift up your eyes on high, and see who has created these things, who brings out their host by number; He calls them all by name, by the greatness of His might and the strength of His power; not one is missing.”

**Matthew 19:26:** “With men this is impossible, but with God all things are possible.”

**Matthews 10:29-31:** “Are not two sparrows sold a copper coin? And not one of them falls to the ground apart from your Father’s will. But the very hairs of your head are all numbered. Do not fear therefore; you are of more value than many sparrows.”

#### References:

- “To fathom ‘the infinite’ with the ‘finite’ ” *Great Commission News*, Fall 2012.  
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## Chapter 10

# Solar Wind and Geomagnetic Field

The sun provides light and heat needed by mankind for living, as well as for timing. However, it also emits “solar wind” which can endanger human lives. Fortunately, the earth has a magnetic field that acts like a shield.

Solar wind consists of fast-flowing electrically charged high-energy particles (mainly electrons and protons) emitted from the sun. Both their flow rate and amount vary with the surface activity of the sun. With a flow rate of approximately 200-900 km/sec in the vicinity of the earth, solar wind is very destructive. But the geomagnetic field acts like a giant invisible shield against the flow, guiding the flow around the earth and thus protecting all living creatures on earth from the destruction. A small portion of the flow is guided toward the vicinity of the geomagnetic poles and interacts with the ions in the earth’s ionosphere, causing aurora phenomena in the sky.

The shape of geomagnetic field lines is like that of a giant magnet, but its strength is only 0.25-0.65 gauss. For comparison, a magnet on the refrigerator may have a strength of as much as 100 gauss. This imaginary geomagnet does not align with the axis of the earth’s rotation, but deviates by about 11.3 degrees. Its south pole is located in Canada, relatively close to the earth’s north pole (about 1,000km apart), and is moving slowly. The geomagnetic north pole is located near the earth’s south pole. The needle

of a compass is a small magnet, which tends to align with the geomagnetic field but with its north tip pointing to the south geomagnetic pole (in the north), because magnetic poles of different signs are attracted to each other. Such a compass was first used by the ancient Chinese for navigation. Some creatures, such as salmon, can find their way back to where they originated even after traveling away for thousands of mile. Such an amazing navigation ability is probably due to their sensing of the geomagnetic field.

The geomagnetic field in high altitude is not as symmetric as that of an ordinary magnet. Being constantly blown by solar wind, its border on the day side (the side that faces the sun) is compressed to a location of about 70,000 km (or 15 times the earth's radius) from the earth. On the other (night) side, its border is pushed away to beyond 200 times earth's radius. Thus, the shape of the geomagnetic sphere is like that of a comet.

Without the geomagnetic field, the solar wind would have wiped out the ozone in the atmosphere, which provides a shield against the harmful ultraviolet light from the sun, or even the whole atmosphere. It has been suggested that Mars used to have an atmosphere like the earth, but was mostly blown away by solar wind because it did not have a comparable magnetic field. Mars' atmospheric density is now reduced to only 1% that of the earth.

In addition to solar wind, the geomagnetic field also shields against cosmic rays coming from all directions. Such rays consist of charged particles (mainly proton and alpha particles) with even higher energy constantly bombarding the earth at a speed close to that of light.

According to paleogeomagnetic studies, during the long history of the earth, the geomagnetic field has reversed its polarity many times. The occurrence of the most recent reversal is estimated to be around 780,000 years ago.

Why the earth has a magnetic field and why the field reverses itself is not really understood presently. The geomagnetic field is possibly caused by an electric current generated by certain heat-driven and electrically-charged metallic fluid flow inside the earth. Another possible mechanism is the differential rotation of different layers of the earth (consisting of a solid inner core, liquid outer core, mantle, and crust) that carry different electric charges. However, this mechanism has not yet been studied in detail.

The earth seems to be so wonderfully designed: Having an atmosphere

to provide oxygen for us to breath, being sufficiently dense to shield us against harmful meteoric impacts, and having an ozone component to shield us against harmful ultraviolet light (see Notes). In addition, it has a magnetic field to protect us against the harmful solar wind and cosmic rays. Under this multiple protection, mankind and other creatures may be able to live safely on earth. No wonder the psalmists and wise men were inspired to praise God, saying:

**“When I consider your heavens, the work of your fingers, the moon and the stars, which you have ordained, what is man that you are mindful of him!”** (Psa. 8:3-4)

**“In the secret place of His tabernacle He shall hide me.”** (Psa. 27:5)

**“Then (when the earth was created) I was beside Him, as a master craftsman; and I was daily His delight, rejoicing always before Him, rejoicing in His inhabited world, and my delight was with the sons of man.”** (Prov. 8:30-31)

#### Notes

Please see the following articles:

- “Earthquakes witness to the Bible”, *Great Commission News*, Winter 2011, pp. 1-3.
- “Geophysical phenomena at Jesus’ second coming”, *Challenger*, Jul-Sep 2012, 14-16.

## Chapter 11

# The Function and Mission of God's People

During the last several decades, Chinese Christians have been paying more attention to missionary work by sending more missionaries to more distant locations among different ethnic/cultural groups. An important issue discussed recently is whether the missionary efforts should be holistic, i.e., covering not only gospel preaching, disciple training, church planting, but also many cultural aspects, such as moral ethics, social care, justice, politics, education, science, arts, media, medical service, and family matters. Most recently, a British scholar, Christopher Wright, even proposed in his books and conference presentations that the missionary scope should be extended to cover ecological and environment-protection matters. This proposal has stimulated an enthusiastic response from Christians worldwide. For example, the Cape Town Committee of Lausanne III, 2011, in South Africa called fellow Christians to take urgent and prophetic action on “creation care;” the Lausanne Movement has appointed a Senior Associate for Creation Care, and Lausanne, together with WEA and other organizations, sponsored a consultation in St. Ann, Jamaica, and came up with two major conclusions in November 2012: (1) Creation care is indeed a “gospel issue within the lordship of Christ” and (2) we are faced with a crisis that is pressing, urgent, and that must be resolved in our generation.

According to Wright's view of the whole Bible, the blood of Christ was shed not only for the fallen human race but also for the rest of the creation in order to make peace with God (Col. 1:20). Thus, he proposed that the Christian "holistic mission" should include not only "gospel mission" and "cultural mission," but also the so-called "creation mission."

Wright's proposal, however, puzzled many Christians and triggered discussions among some Chinese Bible scholars (see a specials issue on "Exploration of Holistic Mission" in *Great Commission Bimonthly*, 97, April 2012). Some of them wondered whether this proposal might have overly extended the range of Christian missionary efforts, thus rendering gospel preaching itself less effective. Others were alarmed by the possibility that the real Gospel might be changed into something else, like the "social gospel" of the last couple of centuries.

In this article, I would like to suggest that the above-mentioned confusion may have been caused by the misunderstanding of Colossians 1:20 and by the lumping together of almost all the Christian efforts into one task, the "holistic mission."

## **The Mission of God's People**

The "mission" that Jesus Christ gave to His disciples is the same mission that He received from the Father, and is clearly and specifically recorded in the four gospels and the book of Acts (Matt. 28:18-20; Mrk. 16:15-16; Luk. 24:45-49; Jhn. 20:21; Acts 1:8): To bear witness for Him and to preach the gospel to all the peoples both near and far in the whole world so that they may be saved, to baptize them, and to teach and make them His disciples. Thus, the mission's dual goal is to preach the gospel to save people in the whole world and to teach and help them grow spiritually so that they may be more and more like Jesus in character and in behavior.

Beside these specific tasks, we as Christians have other things to do also, of course. But those things are mostly the natural consequences of our transformed lives, and thus may be regarded as our normal "functions," rather than "missions." Before discussing them in more detail, let us first try to clarify the following fundamental question:

## For Whom was Christ's Blood Shed?

Wright's argument for Christ's blood shed for all the creation is based solely on Colossians 1:20, which states, "...and by Him to reconcile all things to Himself, by Him, whether things on earth or things in heaven, having made peace through the blood of His cross." This verse indeed made the general statement of "to reconcile all things to Himself...through the blood of His cross," but it does not spell out "How?". Thus, in order to properly understand this statement, we need to examine some other relevant Scriptures. The traditional as well as my own understanding of numerous such Scriptures is that **Jesus' blood was shed for all human beings, and for them only**, in order to reconcile them to God; once the human beings are reconciled, the rest of the creation will subsequently become reconciled with God. My reasoning for this understanding is as follows:

- The problem between God and His creation was originally caused by the first human beings' sin against God, as recorded in Genesis 3. But as a result, not only were the human beings alienated from God but also the rest of the creation; they deteriorated, as shown by the meteorological change (3:8) and the ground being cursed (3:17-18). The rest of creation's deterioration was not their own fault originally but the human's.
- Apostle Paul wrote in Romans 8:19-21: "**For the earnest expectation of the creation eagerly waits for the revealing of the sons of God. For the creation was subjected to futility, not willingly, but because of Him who subjected it in hope; because the creation itself also will be delivered from the bondage of corruption into the glorious liberty of the children of God.**" Thus, the rest of creation's reconciliation with God will probably be a consequence of human beings' reconciliation with God, rather than theirs independently.
- This point (Christ shed his blood for **mankind** only) is more clearly shown in Hebrews 2:16, "**For indeed He (Christ) does not give aid to angels, but He does give aid to the seed of Abraham (people who are justified by faith)**", and in Jesus' calling of Apostle Simon Peter, "**From now on you will catch men**" (Luk. 5:10), and in Jesus' sayings, "**For the Son of Man has come to seek and save that which was lost (sinners)**" (Luk. 19:10), and in Apostle Paul's writing "**Who (God) desires all men to be saved and come to the knowledge of the truth. For there is one God**

**and one Mediator between God and men, the man Christ Jesus, who gave Himself a ransom for all (mankind), to be testified in due time”** (1 Tim. 2:4-6).

- The shedding of Christ’s blood (as a **man**) is necessary for the forgiveness of sin (of **mankind**) (Heb. 9:22); whereas for the rest of creation, there is no sin to speak of. Because even the most intelligent animals were not made in God’s image, do not have spirits to communicate with God, do not know God’s law given through Moses, and do not know what is sinful; thus any of their wrongdoings cannot be counted as sin (Rom. 3:20; 5:13). Nor can they understand the gospel message, repent, ask God for forgiveness, and believe in Jesus (the only way of salvation), and thus be saved. Therefore, all the above-mentioned and other aspects of God’s salvation are not meant for them, but for human beings only (Rom. 5:6-11). However, the rest of creation does and will benefit from man’s salvation, just as they have suffered from man’s fall, as many Scriptures have indicated (e.g., Isa. 65:25)

In short, the reconciliation of the rest of the creation with God mentioned in Colossians 1:20 hinges on the human beings’ reconciliation with God, for which Christ shed His blood. Once human beings are reconciled, the reconciliation of the rest of the creation will follow. As evangelical Christians, we should insist on gospel truths and not let them be perverted, as warned by the Apostles Paul (Gal. 1:6-9) and John (2 Jhn. 9; Rev. 22:18-19). Regarding the care of the other things, such as ecology and environmental protection, there are other people and governments in the world who are making efforts in those areas; whereas the preaching of the gospel, only God’s people can do. Thus, it should be focused on by Christians.

## Functions of God’s People

In addition, Christians should not neglect functioning in other ways toward the betterment of the world, since Jesus told his disciples, “**You are the salt of the earth**” and “**You are the light of the world**” (Matt. 5:13-16). In fact, the original responsibility God assigned to Adam and Eve is to rule over the world for God (Gen. 1:26-28). This responsibility has not been fulfilled ideally by us mankind, because of our fall into sin and death since the beginning. We have become not only short of the glory (and image) of God, but

also short of being the good rulers of the world that God intended. Since sin and all the troubles “**entered into this world through one man** (Adam),” it is God’s plan to **redeem this world through one man** (Jesus Christ) (Rom. 5:18-19). This redemption and restoration process is to begin with mankind and then spread to the rest of creation. After we are born again by repenting and believing in Jesus Christ, we are in a process of being transformed by the Holy Spirit to become more and more like Christ to the betterment of other people and creatures.

Therefore, instead of making efforts in other “missions” that Christ did not command, we Christians should let the God-given functions manifest in all aspects (including cultural and environmental) of our lives, as Christ has already commanded.

## **The Function and Mission of God’s People in Practice**

Of course, the manifestation of these Christian functions, in social-care matters such as disaster relief and education, does not always have to follow gospel preaching in time; they may sometimes precede it either out of God-given love or for the purpose of facilitating gospel preaching. In any case, these tasks should never be allowed to substitute or weaken the critical missionary effort of gospel preaching.

To carry out the various tasks properly, individual Christians, churches, and organizations need to follow the guidance of the Holy Spirit as well as the principles given in the Bible. Realizing the immensity of the task in contrast to our limited ability and resources, rather than over-extending our effort in attempt to cover all aspects of the so-called “holistic mission of God” with equal priority or emphasis, we should do our best with whatever God has led us to do. We need to keep in mind that God’s ultimate goal is not just to make this world better, but to replace it with a new heaven and a new earth, in which we will live with our new incorruptible bodies for Christ forever. This is something only God Himself can do and will do when Christ comes again.

### **Quoted Scriptures**

**Matthew 28:18-20:** “Then Jesus came and spoke to them, saying, ‘All authority has been given to Me in heaven and on earth. Go therefore and make disciples of all the nations, baptizing them in the name of the Father and of the Son and of the Holy Spirit, teaching them to observe

all things that I have commanded you: and lo, I am with you always, even to the end of the age.' Amen."

**Mark 16:15-16:** "And He said to them, 'Go into all the world and preach the gospel to every creature. He who believes and is baptized will be saved; but he who does not believe will be condemned.'"

**Luke 24:46-47:** "Then He said to them, 'Thus it is written, and thus it was necessary for the Christ to suffer and to rise from the dead the third day, and that repentance and remission of sins should be preached in His name to all nations, beginning at Jerusalem. And you are witnesses of all these things.'"

**John 20:21:** "Then Jesus said to them again, 'Peace to you! As the Father has sent Me, I also send you.'"

**Acts 1:8:** "But you shall receive power when the Holy Spirit shall come upon you; and you shall be witnesses to Me in Jerusalem, and in all Judea and Samaria, and to the end of the earth."

**Genesis 3:8:** "And they heard the sound of the LORD God walking in the garden in the cool of the day, and Adam and his wife hid themselves from the presence of the LORD among the trees of the garden."

**Genesis 3:17-18:** "Then to Adam He said, 'Because you have heeded the voice of your wife, and have eaten from the tree of which I commanded you, saying, "You shall not eat of it": Cursed is the ground for your sake; in toil you shall eat of it all the days of your life. Both thorns and thistles it shall bring forth for you, and you shall eat the herb of the field.'"

**Hebrews 9:22:** "And according to the law almost all things are purged with blood, and without shedding of blood there is no remission."

**Romans 3:20:** "Therefore by the deeds of the law no flesh will be justified in His sight, for by the law is the knowledge of sin."

**Romans 5:13:** "For until the law sin was in the world, but sin is not imputed when there is no law."

**Romans 5:6-11:** "For when we were still without strength, in due time Jesus died for the ungodly. For scarcely for a righteous man will one die; yet perhaps for the good man someone would even dare to die. But God demonstrated His own love toward us, in that while we were still sinners, Christ died for us. Much more then, having now been justified by His blood, we shall be saved from wrath through Him. For if when we were enemies we were reconciled to God through the death of His Son, much more, having been reconciled, we shall be saved by His life. And not only that, but we also rejoice in God through our Lord Jesus Christ, through whom we have now received reconciliation."

**Isaiah 65:25:** "The wolf and the lamb shall feed together, The lion shall eat straw like the ox, and dust shall be the serpent's food. They shall hurt nor destroy in all My holy mountain," says the LORD.

**Galatians 1:6-9:** "I marvel that you are turning away so soon from Him who called you in the grace of Christ, to a different gospel, which is not another; but there are some who trouble you and want to pervert the gospel of Christ. But even if we, or an angel from heaven, preach any other gospel to you than what we have preached to you, let him be accursed. As we said before, so now I say again, if anyone preaches any other gospel to you than what you have received, let him be accursed."

**2 John 9:** "Whoever transgresses and does not abide in the doctrine of Christ does not have God. He who abides in the doctrine of Christ has both the Father and the Son."

**Revelation 22:18-19:** "For I testify to everyone who hears the words of prophecy of this book: If anyone adds to these things, God will add to him the plagues that are written in this book; and if anyone takes away from the words of the book of this prophecy, God shall take away his part from the Book of Life, from the holy city, and from the things which are written in this book."

**Matthew 5:13-16:** "You are the salt of the earth; but if the salt loses its flavor, how shall it be seasoned? It is then good for nothing but to be thrown out and trampled underfoot by men. You are the light of the world. A city that is set on the hill cannot be hidden. Nor do they light a lamp and put it under a basket, but on a lampstand, and it gives light to all who are in the house. Let your light so shine before men, that they see your good works and glorify you Father in heaven."

**Genesis 1:26-27:** "Then God said, 'Let us make man in Our image, according to Our likeness; let them have dominion over the fish of the sea, over the birds of the air, and over the cattle, over all the earth and over every creeping thing that creeps on the earth.' So God created man in His own image; in the image of God He created him; male and female He created them."

**Romans 5:18-19:** "Therefore, as through one man's offense judgment came to all men, resulting in condemnation, even so through one man's righteous act the free gift came to all men, resulting in justification of life. For by one man's disobedience, many were made sinners, so also by one man's obedience many will be made righteous."

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## Chapter 12

# A Geophysicist's Life Led by the Good Shepherd

### Encountering the Gospel

The first time I heard the Christian gospel was in the summer of 1953, when I had just finished my first year of study in electrical engineering at the National Taiwan University and had gone back to my home in Taichung for summer vacation. A good friend of my elder brother's, Samuel, came to our house for a visit and told me some things about God and His salvation through the crucifixion of Jesus. I thought that it was hard to believe and so argued hotly with him. Being unable to win the argument, he told me that there was going to be a series of gospel-preaching meetings during the summer and challenged me to attend. Out of curiosity, I did. The preacher's message, though not quite convincing either, aroused my interest for further inquiry, because what he and others had talked about were big issues about life, such as, "Where did we come from?", "What is the human nature?", "What is the meaning of life?", and "Where are we going to be after death?". I was deeply interested in such issues but had no opportunity to explore them in my regular engineering classes at the university.

### Earlier Experience

The reason why I was interested in these issues at the tender age of 19

was because my earlier years were spent mostly in chaotic times, including 8 years of Sino-Japanese (or Second World) War and 4 years of civil war in China, in which I witnessed quite a few tragic and terrifying scenes. I was born in 1934 in the capital city of Nanking (or Nanjing) and, with my family, followed my father's job westward to Wuhan and then to the wartime capital, Chungking (or Chongqing), where I began to attend elementary school. We lived outside the city in a foothill area, which was relatively safe from the constant Japanese air raids. Even so, I was frequently frightened by the wailing-siren warnings, the low-pitch humming sound of approaching bombers, the whizzing sound of the falling bombs in the air, and the loud explosions. Once a bomb fell on top of the shelter cave, in which I and a large crowd were hiding. The wind generated by the blast was so strong that those of us who stood not far from the entrance could hardly stay standing. We did not fall only because it was so crowded. Fortunately, the shelter did not cave in.

To avoid such dangers during the war years, my family made frequent moves to different cities and villages. After the war, which ended in 1945, we settled down at Nanchang in Jiangxi province, where we enjoyed a few peaceful years and I attended a middle school without interruption. Then a civil war broke out in northern China between the communists and the nationalists, and it spread southward rapidly. By the beginning of 1949, my family had to move again. My father got hold of a boxcar, and we originally planned to be towed by a train southward to Guangzhou. However, shortly after the beginning of the trip, my elder brother became ill, and we had to stop at a small station to seek medical help; after his recovery, we could no longer find any train willing to stop and tow our boxcar to Guangzhou. After a long wait, my father managed to get us all on board a crowded train going westward. We were fortunate to have obtained regular seats, while many other people did not; some of them were standing, or sitting dangerously on top of the train, or even lying on some tied wooden boards under the train. Because of the extremely crowded condition, we had to keep the windows open all the time, and when the train passed through some tunnels, the black smoke from the locomotive was unbearably choking. Once when I was looking out of the window while the train was slowly passing through Zhuzhou, Hunan, I saw a man lying on the ground next to the track crying for help. On closer look, I found that his legs were cut off by the train. Yet seemingly no one had stopped to help him. Everybody was running for his/her own life.

With tragic scenes such as this in my mind and a lot of leisure time without anything to do because I was not able to attend any school while

on the move, I often contemplated such questions as, “What is the meaning of life?” and “Where will I be after death?” This unsettled living condition delayed my education by one year, but it also caused me to appreciate the opportunity to go to school, which I took for granted previously. With an awakened interest in studying, I sought tutorial help in mathematics, in order to prepare for the entrance examination for another school, when the opportunity would become available again. I found help from a travel companion, who just graduated from an engineering college.

Our trip took us next to Chongqing and Chengdu, toward the end of 1949. By that time we had sold almost all our bulky belongings, and it seemed that no place was safe enough to go any more in the mainland. The only remaining safe domestic place to escape to was the island of Taiwan, but it was thousands of miles away, accessible only by airplane. Needless to say, seats in a plane were extremely difficult to get, being too few to meet the huge demand at that time (many people even attempted to acquire a ticket with gold bars, but in vain, I heard.). My father somehow managed to get tickets for our family in two military planes, and the one my brother and I took flew to the island of Hainan. On the morning of departure, while the sky was still dark, I was carrying a small piece of luggage and walking toward the plane, parked at a distance. Suddenly a soldier guarding the plane shouted, and I forgot how to respond. Fortunately, my elder brother, who was walking behind me, quickly responded, and we were then allowed to get on the plane. Later, he rebuked me for having not responded promptly, when the soldier was actually asking for the password. The situation was so dangerously tense at that moment that the soldier, seeing that I had not responded, almost pulled the trigger to shoot me.

That was my first time on board an airplane, and I was quite excited. But I was also fearful, because we were flying over a vast area already controlled by the communists. When we finally arrived at Haikou airport in northern Hainan, we were so relieved. But then we had to take off layers of clothes in a hurry, for it was very hot there, even in November. Shortly after arrival, we took a military truck to the southern port of Yulin (now part of Sanya), and from there we got on a military ship to Taiwan.

Being among the last groups of refugees to arrive in Taiwan, which had already become packed by many people from the mainland, my father was only able to get a nominal job from the financially strapped government, with a meager income barely enough to feed our big family of 8 (soon to be 9, because my mother was pregnant, with me being the second child). We

used most of the remaining family savings to buy a one-bedroom Japanese-style townhouse with a tatami floor in Taichung, where the cost of living was lower than Taipei, and we began to live a frugal but peaceful life. Yet I was so happy to be able to go to school again. Because of the previously mentioned tutoring, I passed the entrance examination of the First Middle School of Taichung, and attended the evening classes specially provided for the newly arrived refugee students. After one semester, I got into the Affiliated Middle School of the Normal University in Taipei, and two years later in 1952, I got into the electrical engineering department of National Taiwan University.

## Searching for Truth

During the four years after my first encounter with the gospel, I continued to attend various church meetings in my spare time to learn more about Christianity. I also began to read the Bible and some other Christian books, including *“Is there God after all?”*, *“Is Jesus the Son of God?”*, and *“Is the Bible inspired by God?”*, which I found very helpful. I tried to learn what the other religions had to say also. My interest was to search objectively for truths, not some soothing teachings. I began to know more about the gospel and the Bible, including who the true God is and His love for and plan of saving mankind from sin and death through His son’s incarnation, death on the cross, and resurrection. All such Biblical teachings sounded good, but I wanted to make sure that they were true. One thing I had a difficult time to accept at first was that I, like everyone else, was sinful (Rom. 3:23), having been long considered a nice son at home and a good student at school. But then I learned that this is because we are measured not by human standards, but by God’s: **“For all have sinned and fall short of the glory of God, being justified freely by His grace through the redemption that is in Christ Jesus.”** (Rom. 3:23-24). And Jesus showed how high God’s standard was: **“You have heard that it was said to those of old, ‘you shall not commit adultery.’ But I say to you that whoever looks at a woman to lust for her has already committed adultery with her in his heart.”** (Matt. 5:27-28); and **“You have heard that it was said, ‘You shall love your neighbor and hate your enemy.’ But I say to you, love your enemies, bless those who curse you, and do good to those who hate you, and pray for those who spitefully use you and persecute you”** (Matt. 5:43-44).

After realizing that God’s requirement was so high, I began to re-examine myself and found many sinful elements in my heart, such as selfishness, hatred, jealousy, and lust. I also recalled many “little” misconducts in my life, such as buying a short-distance bus ticket while taking a longer ride, and put-

ting on a soldier's uniform to watch movies for free at theaters in war time. So I soon realized that, by God's standard, I was sinful indeed.

However, I still wanted to challenge what Jesus said in John 8:34: **"Most assuredly, I say unto you, whoever commits sin is a slave of sin."** I admitted that I had committed those sins, but I thought that was only because I did not know them to be sinful; I was not convinced that I was a slave of sin. So I started to try to live a perfectly moral life without any sin, big or small, in my action or in my heart. I wanted to prove that Jesus, and the Bible in general, was wrong. But, it did not take long for me to find that I could not do so, no matter how hard I tried. It was so natural for me to become hateful when being mistreated, jealous when inferior to someone else, proud when doing better than others, and greedy and lustful when being tempted in certain situations. I felt just like Apostle Paul, who said in Romans 7:18, **"I know that in me (that is in my flesh) nothing good dwells, for to will is present with me, but how to perform what is good I do not find."** I realized that not only had I sinned but also that I was a slave of sin, and thus in need of the deliverance that Jesus promised: **"Therefore, if the Son makes you free, you shall be free indeed."** (Jhn. 8:36)

Having so experienced what Jesus, and the Bible as a whole, said was true, I began to have faith in Him. I tried to confess my sins and ask Him for forgiveness. However, after many prayers I did not feel any difference, such as the peace of being forgiven, as mentioned by some Christians. On one occasion I had a dream, in which I found myself somehow in deep water, about to be drowned; then I saw a man in white robe in the air, and I prayed earnestly, "Lord, Save me!" He stretched out his hand toward me, and immediately I was lifted up. Then I woke up. Strange and interesting as this dream might be, I was not quite convinced that I was truly experiencing God answering my prayers. It was perhaps due to the helpful advice that I received from someone, that I should trust God's words rather than my own feelings, that I finally made up my mind to publicly accept Christ.

One evening in 1957, I attended a gospel-preaching meeting at a church in Shinchu, where I was serving as a ROTC air force officer. When the preacher finished his message and was inviting people to accept Jesus by going to the front, I rose up from a back seat and went forward. After the meeting, I walked back to my dormitory in the drenching rain without an umbrella. Being quite late, I dried myself, changed clothes, and went straight to bed to sleep. When I woke up, I thought I had slept only a few seconds. But then the sun was already shining brightly into the room. So I realized that I had slept soundly not just for a few seconds but a whole night, without waking up or having any dreams. I felt

so peaceful and joyous in my heart, as I had never experienced before. Everything seemed so fresh and beautiful. I felt like asking everyone I met: "Are you a Christian?" I began to see things differently, to feel life to be more meaningful and bright, and to value eternal spiritual things more than temporary material things. I found my life to be greatly changed!

## **Graduate Studies in the US**

While in college, I never dreamed of doing graduate studies in the US, because of lack of financial resources. At that time, I was only interested in obtaining knowledge but did not quite care about grades. However, such an opportunity suddenly came, shortly after I became a Christian: Samuel, who had borrowed \$2,400 from his friend as the required guaranty by the US consulate, had gone to the US earlier and found a job and thus had no need of the money, so he made it available to my elder brother to use for the same purpose. My brother, however, had just found a well-paying job at an airline company, newly founded by the retired US general Chennault, and preferred to stay in Taiwan temporarily to support our family. So, he made this money available to me. Surprised by this good news, I started to search for information about and gather application forms for US universities, which I had known very little about. One day, while walking on the campus of Taiwan University, I saw a classmate far away, waving something at me and asking whether I wanted to have it. It turned out to be an application form for Duke University, which I accepted gladly, of course. Thus, I included Duke in my applications to several universities.

For a recommendation, I went to see Prof. Chu of the electrical engineering department, and he gave me a handwritten draft, which I gave to my brother to type, for he was the only person I knew who had a typewriter. Unexpectedly, being so enthusiastic, he not only typed up the letter but also signed it for the professor. With this letter in hand, I hesitated for quite a while, not knowing what to do. I could not send it out, because the signature was not genuine; nor did I want to bother my brother to type another copy, because he was really busy and might get offended. After a hard struggle, I reluctantly sent the letter out to Duke, knowing that the text was not altered. But as soon as I put the letter in the mail, I began feeling so guilty. I knew immediately that I did something wrong. For quite a few days, I did not know what to do. I tried to rationalize it, but no matter how hard I tried, I could not get rid of the sense of guilt. Finally, I was compelled to go to Prof. Chu to tell him what I had done. He was displeased, understandably, but was kind

enough to let this matter go. However, possibly because having observed that I was somewhat hesitant, he asked me not to do anything more, which might cause us to “lose face” as Chinese. With Prof. Chu’s consent, I thought everything was then alright. But not so. I still felt guilty and uneasy. After more struggles and prayers, and against some friend’s advice, I was compelled to send a letter to Duke, embarrassingly confessing that the signature of the letter was not genuine. Then I had peace in my heart again. But I also thought that I might have ruined my chance of going to Duke.

However, a few weeks later, I got a reply from Duke, asking me to ask Prof. Chu to send them another letter. I was relieved, on the one hand, that I had not ruined this opportunity, but, on the other hand, I was led into a quandary because Prof. Chu had asked me not to do anything, and I did. Yet I could not bypass Prof. Chu and go to another professor for help because Duke specifically asked for him to do so. After another difficult round of struggling, I finally gathered enough guts to see Prof. Chu and tell him what I had done. He was understandably displeased but was kind enough to give me another hand-written draft. I got it typed up and signed by him, and then sent it out to Duke.

When the replies of the different universities came early in 1958, I found myself admitted into only a few of them, which was not unexpected because of my mediocre GPA. Among them, however, was Duke, which even offered me a \$600 research assistantship. Thus I chose to go to Duke, not knowing that it was a private university charging higher tuition. When I went to the US consulate to apply for a visa, I listed the only person I knew in the US, Samuel, as a reference, not knowing that this would bring another problem that was going to block my progress for several months: The US consulate checked the source of my guaranty money and found out that it had been used before by Samuel himself. They became suspicious of any fraud that might have been involved. This not only frightened me but also Samuel and his friend who kindly lent him the money. And, in view of the fast-approaching registration date, I was so anxious but could not do anything but pray and wait, beside trying to use the time to catch up with my English-conversational skills.

After a long delay, I got the decision from the consulate, which granted me the visa but with the restriction that the \$2,400 money might not be drawn from the bank immediately, but periodically during the entire year. Thus, I tried to get ready hurriedly, and my brother tried to help me in borrowing money for the trip. Because of the delay, I had to take a flight instead of a ship, but the old propeller airplane that I took had some mechanical problems, and shortly after taking off, we landed in Okinawa. Although being somewhat anxious, I

was glad to have this opportunity to do some sightseeing in a foreign country for the first time. Over the next couple of days, the plane took us to Guam and Honolulu, and then it landed at Oakland airport in California. From there I took a bus ride of 3 days and 4 nights across the US continent with only about \$115 left in my pocket. After the long flight, the long bus ride made me really tired, because I needed to constantly watch out for the transfers and could not lie down to sleep. I was hungry also, because I did not quite know what food to buy, not knowing what a hamburger or a hot dog was. So by the time I got to Duke to see my adviser (Prof. Vail, who was also the chairman of the EE Department), I was exhausted. When he saw my condition, he kindly called in a fellow student to take me to his apartment to rest for a night. The next day, when I went to see him again, I was pleasantly surprised to hear that he had decided to raise my assistantship to \$1,000. He also told me that I needed only to take half of the required courses, because the other half of my time was for research (which actually would later provide the content for my M.S. Thesis), and thus I needed only to pay half of the tuition! One of the first courses I took was taught by him, and he was kind enough to repeat his first lecture, which I missed because of my late arrival. Knowing that I was slow in English comprehension, he even slowed down his lecturing pace for me, although the other classmates were all Americans. Other professors (most of them Christians), staff members, and students were very kind to me as well.

One day, he invited me to lunch and told me why they granted me the assistantship. It was decided in a faculty meeting of the engineering college. When the dean heard about the matter of my recommendation letter, he suggested that “this student should be supported.” This outcome was of course totally beyond my expectation. When I confessed my wrongdoing to Duke, I was only trying to obey God’s leading, in order to keep a clean conscience without any regard to possible consequences. Yet it turned out to be such a blessing: even with a mediocre GPA, unknowingly I had gotten into one of the finest universities in the US and with financial assistance that was basically enough for everything. Although, I still took some odd jobs, such as babysitting and grading papers for a mathematics professor, in order to pay back my debt. During the summer, I did not need to go to some other big city to earn money by laboring in restaurants and shops, as many other fellow students from Taiwan used to do, because Prof. Vail offered me an easy job of helping with a summer class for some company employees.

From this experience I learned my first important lesson as a Christian—to live a life of trusting and obeying God. I experienced the truthful-

ness of many Biblical verses, such as:

**“For my thoughts are not your thoughts, nor are your ways my ways,” says the LORD, “For as the heavens are higher than the earth, so are my ways higher than your ways, and my thoughts than your thoughts.”** (Isa. 55:8-9)

**“Trust in the LORD with all your heart, and lean not on your own understanding; in all your ways acknowledge Him, and He shall direct your paths.”** (Proverbs 3:5-6)

## A Supernatural Experience

During the two years at Duke, I both studied hard and paid attention to my grades in order to prepare for transferring to a even better graduate school for my Ph.D. study. I took all the required courses for my M.S. degree and got excellent grades but did not finish my thesis in time due to language difficulty. Yet with the good recommendations of my professors, I obtained admission with assistantship in EE to Stanford, UC Berkeley, and Princeton. I chose to attend Princeton, because of its reputation in Physics (a name associated with Einstein in my mind) and my intention of shifting my major to physics, in accordance with my interest in seeking truths. In hindsight, this was a poor choice, because in EE, the other two universities were much better, and the assistantships they offered were for research (useful for writing my thesis), while what Princeton offered was for teaching, which required a fair amount of time to help the undergraduate students without benefiting my own study.

In order to prepare for a shift to physics, I took a course on Theoretical Mechanics, required for seniors majoring in physics. It turned out to be very difficult for me, because of my relatively poor background in physics and the excellent quality of the classmates. There were many homework problems I could not solve. When I also did poorly in the mid-term examination, I became worried about the possibility of failing this course and consequently being kicked out of the university and the country. So I began to spend a lot of time studying this course. But no matter how hard I tried, I could not comprehend the course materials very well. As the final examination was fast approaching, I became more and more worried, and my mind became so foggy that I could not absorb anything. Thus I began to pray earnestly, as I had neglected to do for a long time, but to no avail. This frustrating condition lasted for a long time until the last day before the final examination. Then, it seemed like some bright light began to shine into my mind and disperse all the fog. With gratefulness and thanksgiving, I picked up the textbook again and studied carefully

from the beginning. Surprisingly, I found that I could comprehend one point after another quickly, even without having to go through the detailed explanations in between. By supper time on that day, I had made a lot of progress through the textbook already. Then, at the dinner table in an old lady's house, where about 10 people regularly ate together, someone mentioned that he had a solution book for my textbook. I borrowed that book and studied it quickly that evening, and learned how to solve many problems, which I could not before. After a short but good sleep that night, I continued my study of both books the next morning with similar effectiveness. By the time of examination that afternoon, I found myself to be quite well prepared and calm. Prayerfully, I entered the classroom and took the examination sheet from the professor to see if there was any problem that I could solve. When I found one, I quickly solved it. Then, I searched again and found another, and I solved it as well. In this way, I solved all the given problems by the end of the examination.

After about one week, I went to see the professor to inquire about my grade. While I stood anxiously by his desk, he pulled out a record book from a drawer and cast a strange look at me, saying that my Grade was 1<sup>+</sup> (The grades for undergraduate students range from 1 to 7, with 1 at the top). This was way beyond my expectation, and I was so glad and grateful to God for His timely and wonderful help. Afterwards, I kept thinking about how nice it would be if I could keep such a state of mind from then on. I tried, but could not. This supernatural experience has, however, greatly strengthened my faith in God, and helped me in believing the reality of the many miracles recorded in the Bible.

## **A Blessing in Disguise**

My second semester at Princeton was very hectic. I needed to not only take the required classes and serve as a teaching assistant, but also to finish and type up my M.S. thesis and then go back to Duke to take the oral examination for the degree. In addition, I had to take the qualifying examination, which I had somehow neglected. As a result, I did not do well in the homework of a Servomechanism course, and thus offended the professor who taught it. He might have thought that I was lazy or disrespectful to him, and often angrily stared at me and warned me. I was quite frightened but had no time to do better. Subsequently, I got a low passing grade for this course, but unfortunately failed the qualifying examination and was not even given a chance to take it again. Thus, all of a sudden, I fell into the awful situation that I had dreaded previously. I had to quickly find another university to go to, or else I might be kicked out of this country. So, I wrote to Stanford and Berkeley, asking

whether I could be readmitted, having been admitted the previous year. They responded promptly, asking why I wanted to leave Princeton. After I told them the truth, they replied that they could not accept me either, if this was the case.

At this critical juncture, a fellow graduate student, whom I had met the previous summer, told me that he had been offered admission to the Engineering Physics Department of Cornell University the previous year but chose to come to Princeton. He still had an extra application form, which he could give me. So I took the form and made a quick application to Cornell. For recommendation, I asked my adviser at Princeton, Prof. Warfield, and he immediately agreed. He even told me that there was no need to write a recommendation letter, because he was just about to go to Cornell for a meeting and thus could talk to the professors there in person. Actually, that was the department where he got his Ph.D. from. Shortly after his trip, I got a letter from Cornell, asking me to go there for an interview. With the help of an elderly Christian, Dr. Fullerton of the Princeton Evangelical Fellowship, I got to the airport, flew to Ithaca, and then took a ride to Cornell. I was interviewed by two brilliant young professors, who had just arrived there themselves. One of them, Prof. Webb, accepted me immediately as his first Ph.D. student and offered me a research assistantship! I was so relieved and grateful to God for His timely help. After flying back to Princeton to share this good news with Dr. Fullerton, we joyfully gave thanks and praises to God together.

Later, I discovered pleasantly that the switch from Princeton to Cornell had not only led me closer to the field of physics as I had wanted, but also gotten me into an academically stronger department. In addition, because Cornell had female students, unlike Princeton at that time, I got the chance to meet the girl who later became my wife.

## **The Romance**

My life as a graduate student at Cornell during 1961-65 under Prof. Webb's guidance was busy, fruitful, and happy. Soon after my arrival, I found and joined a small group of Chinese students, meeting together weekly for Bible study. During the second semester, when I was chairing the meeting, a beautiful new face showed up, and it belonged to a girl, Bi-Shia, who had just arrived from Taiwan. She was brought in by a former schoolmate of hers, Sue. She looked tired but in good spirits. After that moment, we had several opportunities to get together, both at the Bible study and when shopping for groceries. I co-owned an old car at that time and sometimes took friends along when going grocery shopping.

Later, I learned that she was raised in a well-to-do family in southern Taiwan. Having been a top college student all along, she was quite self-confident and did not feel any need for God. She had been offered admission and research assistantship two and half years before but could not come, being unable to pass the government-required tests that included subjects such as politics and Chinese geography and history, which she disliked. Yet, Cornell renewed their offer repeatedly. Then in early 1962, upon learning that this requirement was abolished for those who had obtained financial awards from reputable U.S. universities, she wasted no time in getting ready for the trip. When she arrived at Cornell, it was during spring vacation, and no restaurants were open on campus. Being tired, hungry, and frustrated, she found herself so limited and helpless, and was thus humbled. So, when Sue invited her for dinner and to the Bible study, she gladly obliged.

One day, Prof. Webb invited all his graduate students to his house for a party, and he encouraged everyone to bring a guest, whether wife or friend. I went to Bi-Shia's laboratory and extended my invitation. At first she asked me to invite someone else instead, but upon my insistence she agreed. From then on, we became closer to each other.

We often studied at the library together, and then took a walk on the beautiful campus, located on top of a hill with a lake and two gorges with two little bridges across the streams flowing under the bridges. Soon we fell in love, and life became so wonderful. Even though I had to study hard, she did not, because, due to her late arrival, she was just doing research and auditing some courses in preparation for the following academic year.

In hindsight, though both of us had been very much frustrated by our respective failures, they turned out to be blessings in disguise. The timing of both our arrivals at Cornell to meet each other was just right. For this we have been deeply grateful to God.

### Prayers Answered

After a few romantic months of being together, we decided to get engaged. One day when I went to her laboratory, I met her adviser. That evening when we got together in front of the library, she asked me expectantly what I planned to do in the future. I told her honestly, "I don't know. Wherever God wants me to go, I will go, even to Africa." Then she said that she did not feel like studying that evening and wanted to go back to her dormitory. So I went back to my apartment somewhat puzzled.

It was only later that she told me what happened on that day: After I

left her laboratory, her adviser asked her who I was. When she told him that I was her friend, a Ph.D. student in engineering physics, he praised her for her wise choice, saying that engineering physics was one of the best departments at Cornell and its graduates were highly paid. Having heard these words, she was so happy and was dreaming of having a comfortable married life with a husband of good reputation as a scientist. Yet this dream was dashed to pieces by my straight answer that evening. She had been raised in a well-to-do family and did not want to go to Africa to live a difficult life, or even possibly suffer poverty and danger. But she did not want to part from me either. Thus, she got into a quandary and could not fall asleep that night. Yet she had to meet her adviser the next morning. Being painfully entangled by numerous knots in her mind, she finally thought, “Why don’t I try to pray to God?” So, she prayed for the first time in her life: “Oh, God, if you truly exist, please untie all the knots in my heart.” After the prayer, suddenly all the knots got untied, and she knew for certain that God existed and was listening to her prayer. Feeling peaceful and enlightened, she prayed again: “If Chi-Yu is the man you meant for me as my husband, please bless our marriage.” With that, she fell into a sound sleep. This is how she became a Christian and how she was assured that our marriage was God’s will. After this experience, things of the world lost their glittering in her sight, and she became willing to live a simple life with me. Her views of life and the world radically changed.

Soon afterwards, we decided to get married in early September, prior to the beginning of the following school year. In view of the marriage situation in society nowadays, perhaps I should mention that, by God’s grace, we never violated God’s law against premarital sex, though there were convenient opportunities to do so. The most tempting occasion occurred when we were driving to New York city to visit my brother that summer, and we stopped at a cheap hotel for an overnight stay. We rented two neighboring rooms with a connecting door in between, and left this door open all night out of security concerns. But we never crossed the line set by God.

## **Married Life**

Prior to our wedding, we planned to have a honeymoon trip to both Niagara Falls and Thousand Islands but were short \$40 by Bi-Shia’s calculation. I told her that, if the Lord was willing, He would provide. To our amazement, we found a check of exactly \$40 (which was quite generous at that time) among the wedding gifts. It made our trip possible.

After marriage, we had to live a frugal life even with two incomes, because we needed to save about half of my income to help my parents and

five younger siblings back in Taiwan. We hardly had any furniture, nor did we have any bank account or insurance. Yet we did not worry, only trusting in God for everything, and we lived a very busy and happy life.

Bi-Shia became pregnant shortly after the wedding, and we had to begin to save money for pregnancy care and delivery, for which we saved \$350. At delivery time, however, the doctor said that she had encountered difficulties and might need to have a c-section procedure, which would cost more than \$1,000. Since this was an “astronomical” figure to us, we prayed earnestly to God for a smooth natural delivery. After a very painful 27-hour-long laboring, and with the doctor’s helpful pull, Bi-Shia finally delivered a precious healthy baby girl with only some minor scratches on her face. When the bill came, it was exactly \$350. We praised God for His care and sufficient provision.

Our daughter brought us a lot of joy and not much distraction from our studies. This was especially so when a nice old Christian lady came to stay with us. She was none other than Samuel’s mother who had just come from Taiwan to live with Samuel. However, she was not able to get along with Samuel’s non-Chinese wife, since she could not speak English and Samuel’s wife could not speak Chinese. Upon receiving Samuel’s inquiry about her possible stay with us, we were more than happy to agree. She stayed with us until I almost completed my study at Cornell in September 1965.

## New Adventure

When I was about to graduate and applying for jobs, I received an offer of post-doctoral research fellowship in seismology at Caltech, where many famous seismologists had worked. This offer was attractive, additionally, because my thesis research was on fracture mechanics and earthquakes are a large-scale fracture problem important to society. So I accepted this offer, and we started to get ready for the trip in a hurry. Shortly before the departure, we bought a cheap but new small VW “beetle,” using \$1,600 saved from Bi-Shia’s one-year income after she finished her M.S. study. I drove that car for about a week—3,000 miles across the U.S. from Ithaca, NY, to Pasadena, CA. During the trip, I had to slow down and use low gears when climbing the mountains because of the lack of power, and open the windows when passing through the scorching deserts because of the lack of air conditioning, but at least I did not have to worry about any breakdowns, as I had often encountered previously with my old cars. Thus I began my scientific career as a geophysicist.

(A digest of this article, entitled “Beside still waters: A Geophysicist’s path,” was published in *Challenger* Vol 55 No.3, 2016, pp.1-8.)



# **Great Commission Center International**



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### About the Author

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