

# Two Thoughts

## *Regarding Science, the Bible, and our Ability to Defend Them*

It is easy to get lost in a discussion about science and the Bible. There are so many things to distract us. Do we focus on the historical relationship between science and religion? The historical interpretation of the Bible? The ability of science to produce technology today? Any one of these rabbit trails can easily detract us from important issues relating to science and the Bible.

In light of the ease with which we can be confused, here are two observations that can help us refocus our attention. Note that these two thoughts are not necessarily capable of cutting through the weeds or simplifying complex arguments into easy concepts. Rather, it is simply a refocus, taking us away from the rabbit trails back to what is significant in the relationship between science and the Bible.

## **Science is Incomplete: It Needs a Foundation**

This concept may easily be the most difficult to accept. It is not too difficult to explain, or even appreciate, but its implication to a society, such as our own, that regularly looks to science for guidance is counterintuitive.

To begin, let us quickly run through the steps of the scientific method. Keep in mind that these steps, while important, are not necessarily rigorous: you may see these same steps explained in a slightly different manner. That is okay, since it is the main concept of the scientific method that is important, less than the actual steps used.

1. Make an observation about the world.
2. Create a hypothesis to explain the observation.
3. Test the hypothesis with an experiment.
4. Determine whether the results of the experiment falsify or verify the hypothesis.

While these steps help codify the scientific method, I want to actually focus on the logic of this method. Specifically, there are two notable types of reasoning needed to follow

the scientific method. The first is inductive reasoning. Inductive reasoning is extrapolating from multiple observations to a single concept. For example, back in the 1600's, when scientists began to look at living things under microscopes, they noticed that they always saw cells in these living things. They eventually concluded that all living things are made of cells. This conclusion is now an important tenet in cell theory. Notice how multiple observations (every observation of cells under a microscope) was used to extrapolate a single concept (every single living thing is made of cells).

Inductive reasoning is necessary to create the hypothesis. All a scientist has are his own observations and the documented observations of others. The scientist then takes these observations and condenses them into a single statement that probably applies to everything.

That word "probably" highlights the problem with inductive reasoning: it is technically illogical. Sure, we can make multiple observations and conclude that something is probable or likely, but that does not tell us what actually is. There is still the possibility that further observations can change what is deemed probable or likely. Take the observation that all living things are made of cells. What if some living thing was to be discovered and it was found that it functioned without the need for cells? That would prove the statement "all living things are made of cells" to be false. Do we know that such a creature does not exist out there? No, because we have not been able to observe all living creatures alive today or throughout history. Thus, the possibility exists that a discovery could be made that will falsify a major tenet of cell theory. As this illustration shows, an idea, any idea, built on inductive reasoning can be falsified. Thus, inductive reasoning does not lead to a logical conclusion, just a possible conclusion.

The other type of reasoning used is deductive reasoning. Deductive reasoning follows an "if-then" format. For example, "If all living things are made of cells, then every time we observe a living thing under a microscope, we will find cells." Unlike inductive reasoning, deductive reasoning is logical: it follows precise rules of logic in order to reach a proper conclusion. In the scientific method, deductive reasoning is used to test the hypothesis. If the hypothesis is correct, then certain things will be observed. The experiment checks to see if those things actually occur.

While deductive reasoning is logical, it has one significant weakness: it cannot be used without a starting premise. The premise is the starting statement. As it is used in the scientific method, the hypothesis functions as a premise. Note that the whole point of the scientific method is to test the hypothesis. If there is no hypothesis, there is no

statement to test, and deductive reasoning cannot be applied.

Now we run into a difficult situation. Deductive reasoning is used to test the hypothesis. Without the hypothesis, deductive reasoning cannot be used. Yet, in order to form a hypothesis, inductive reasoning, which cannot prove anything to be true, must be used. Deductive reasoning can easily be used to prove something false: all one has to do is find a counterexample (an observation that is the opposite of what is expected). However, getting results that are consistent with the hypothesis does not mean that the hypothesis is true: there is still the possibility that further testing will falsify the hypothesis. It is because of this reasoning that hypotheses are either falsified or verified: we can tell when a hypothesis is false but we cannot tell when a hypothesis is true. The best we can do is claim that a hypothesis is consistent with observations so far.

While it is rarely emphasized, this is a big problem with the scientific method: it cannot prove anything to be true. This inability is not a limitation of human observation nor a limitation of available data (though those two things can make the problem worse), it is simply that there is no rigorous logical defense of a hypothesis. Ultimately, every single hypothesis, and thus every single theory, is subject to possible falsification pending future experiments.

From a practical viewpoint, whether or not science can determine truth is irrelevant. Science can be used to produce models that work, insofar as these models can be used by engineers, doctors, architects, and so forth to create things for a practical purpose. However, "working" and "truth" are separate concepts: the former deals with application while the latter deals with the nature of reality. In short, science cannot, by itself, lead us to an understanding of reality. There must be some other knowledge that can be coupled with science to lead us to conclude that science basically leads to an understanding of reality. Without that outside knowledge, science will always be incomplete.

## We Must Either Interpret the Entire Bible Literally or Allow Any Part of the Bible to be Questioned

We will switch gears rather dramatically now. We considered the completeness of science, now let us consider how well the Bible is treated as an authority. The reason we

have to consider the authority of the Bible is twofold. First, if science is incomplete on its own, we need some other authority to help us determine truth. Second, the part of the Bible that has the greatest implications to our understanding of science, Genesis 1-11, regularly gets interpreted and reinterpreted a variety of ways. What we will see is that it is necessary to interpret the Bible consistently, for if we do not, any part of the Bible can be questioned.

A problem we can encounter with interpreting the Bible is that the original text was written in Hebrew or Greek. Thus, any Biblical text we read today is a translation. Unfortunately, reinterpretations of Genesis often rely on reinterpretations of the original Hebrew. For example, some people critique the Creation Week described in Genesis 1 as a period of time longer than a mere week. This is done, in part, because the Hebrew word for "day" can also be interpreted as an indefinite period of time.

Does a person have to be a Hebrew scholar in order to understand the true meaning of Genesis 1? I do not think so, as long as we assume that the translators of our English versions of the Bible knew what they were doing. The original Hebrew had a meaning. The translators took that meaning and put it into English. They have already done the work of understanding what the words mean. Now we can take the meaning they have given to use and understand what the Bible says.

Naturally, there are slight variations in how the translators thought the meaning should be expressed. That is why we have different versions of the Bible, like the King James Version and the English Standard Version. While these translations may appear to highlight that translators get their translations wrong, they actually can provide a benefit. We can compare different translations of the Bible to get a better understanding of the original meaning of the Hebrew text. Because of these various Bible translations, it is not necessary for us to become Hebrew scholars in order to understand the meaning of Genesis 1. If we look at something like the description of the Creation Week in Genesis 1, we can understand the word "day" to mean a 24-hour cycle, because that is what the majority of translators decided was the original meaning in the Hebrew.

Beyond trusting translators to do their job, the other thing we need to do is to interpret passages of the Bible literally. Now, because this word has been abused, it is necessary to explain what I mean by "literal". I mean that we interpret a passage according to its literary style. For example, we interpret poetry poetically. When Psalm 23:1-2 tells us that

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*The LORD is my shepherd; I shall not want. He makes me lie down in green pastures. He leads me beside still waters,*

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we understand it to be a metaphor for God's kind care and provision for His people. We interpret it this way because it is poetry and poetry is replete with imagery. Similarly, when we read about Jesus feeding the 5,000 in Matthew 14:13-21, Mark 6:32-44, Luke 9:10-17, and John 6:1-15, we interpret it as a historical event. It was not presented as a teaching of Jesus, it was not presented as an illustration, it was presented by all four Gospel writers as an account of an actual event.

For the most part, people have no problem interpreting the context of a passage of the Bible. Genesis 1-11, and especially Genesis 1, is an exception. While it is written as a historical document, some people interpret it as poetic, figurative, or spiritual reality, basically anything but physical reality.

Before moving on, I want to emphasize that Genesis 1 is written as a historical narrative. It starts by putting the Creation Week in a historical context ("in the beginning," verse 1), it describes events that each occur within a single 24-hour day (the phrase "and there was evening and there was morning, the *nth* day" is given at the end of every day, verses 5, 8, 13, 19, 23, 31), and it describes the creation of people, namely, Adam and Eve, who are treated as historical figures throughout the rest of the Bible (for example, I Chronicles 1:1, Luke 3:38, Mark 10:6-8).

Some people dispute the previous paragraph. They may make claims, such as "Genesis 1 follows a pair of triads, which is a poetic form," or "the word 'day' actually has multiple meanings throughout Genesis 1, so we cannot be dogmatic that it means a 24-hour cycle." Both of these claims make a similar error: they read into the Bible, attempting to change its meaning. To see how this works, let us briefly consider each claim.

The pair of triads refers to the sequence of events of the six days of creation. The first three days and the last three days each follow a repeating pattern. The argument goes that day one deals with the creation of light, day two with the separation of water and creation of the expanse (often interpreted as the atmosphere), and day three with the creation of dry land. The following three days each fill the things created on the previous three days. Day four sees the creation of celestial bodies that shine light on the Earth, day five with the creation of fish (in the water) and birds (in the air), and day six with

land animals. Such a pair of triads is considered to be a poetic pattern, indicating that Genesis 1 is figurative, not historical. The problem with this interpretation is that it is selective and contradictory. Consider that water was not created on day two, but on day one (Genesis 1:2), thus the fish fill the waters on the wrong day of the pattern. Second, the expanse can also be interpreted as including outer space. If that is the case, then the celestial bodies actually fill the expanse which was created on the second day, not the first. Note also that something is notably missing from the pair of triads: plants do not figure into the pattern, even though they were noticeably created on day three. All of these problems show that the pair of triads is not an actual artifact of Genesis 1, but a supposed pattern imposed on the text.

As for the multiple meanings of day, the argument goes like this: while it appears that the word "day" means a 24-hour cycle in verses 5, 8, 13, 19, 23, 31, the word "day" is also used to mean the daylight portion of a 24-hour cycle in verse 5 and an indefinite period of time in Genesis 2:4 (which is actually part of the Genesis 2 narrative, but the context is similar). These observations are correct, but they miss a significant point: we can identify each meaning of "day" based on its context. Verse 5 contrasts "day" with "night," so it is clear that it refers to daylight. Genesis 2:4 speaks of "the day that the LORD God made the earth and the heavens," but that is a common figure of speak, where "day" simply refers to a period of time defined by context of the phrase. It is no different than saying, "back in my grandfather's day." Again, the context makes the meaning clear. Finally, in verses 5, 8, 13, 19, 23, 31, the phrase "day" is coupled with "evening and morning," making it clear that "day" is referring to a normal 24-hour cycle. Thus, the different meanings of "day" are interpreted from the context of the specific verses: it is not an indication that the word "day" has no specific meaning throughout the passage. To twist these multiple meanings of "day" into a suggestion that it has no meaning is to overlook how we interpret everyday language.

There are more critiques that have been made about Genesis 1, and many more that can be imagined in the future. Rather than trying to counter every individual argument, let us make a broad observation. If we can reinterpret the literary style of Genesis 1, what other passages of the Bible can also have their literary style reinterpreted? For example, if multiple uses of "day" indicate uncertainty in its meaning, what are we to make of Peter's sermon on Pentecost? Here is an excerpt from Acts 2:14-17:

*Men of Judea and all who dwell in Jerusalem, let this be known to you and give ear to my words. For these people are not drunk, as you suppose, since it is only the third hour of the day. But this is what was uttered through the prophet Joel: And in the last days it shall be, God declares, that I will pour out my Spirit on all flesh.*

The first use of "day" refers to a 24-hour cycle, since it is used in the context of the third hour, yet his second use of "day" is an indefinite period of time. Do we then trivialize Peter's sermon as mere metaphor or spiritual reality, as some would claim of Genesis 1? There needs to be consistency of interpretation across the Bible, for if we make one passage a simple metaphor (Genesis 1) then we risk making other passages (Acts 2) metaphor as well.

The preceding paragraph is an example of the main principle, "We Must Either Interpret the Entire Bible Literally or Allow Any Part of the Bible to be Questioned." We should use this principle to judge the trustworthiness of the various interpretations of Genesis 1. If the interpretation rests on reasoning that can lead to faulty interpretations elsewhere in Scripture, then the interpretation is probably faulty. If the interpretation rests on reasoning that coincides with established interpretations of other parts of Scripture, then it is probably reliable.

## The Connection Between These Two Thoughts

On the surface, "science is incomplete: it needs a foundation" and "we must either interpret the entire Bible literally or allow any part of the Bible to be questioned" seem like disconnected thoughts. In fact, they are closely related, especially for those who consider the Bible to be the Word of God.

If science is incomplete, then it needs to be supported by some other truth. Recall that no hypothesis or theory is safe from falsification: every scientific idea may be proven wrong. Would it not be nice to have some truth that is not subject to falsification, something that can give us some insight about the natural world? How about, "In the beginning, God created the heavens and the earth" (Genesis 1:1)? That informs us of the origin of the natural world. What about the command to fill the earth and subdue it (Genesis 1:28)? That informs us about the nature of the world: we humans are capable of interacting with and manipulating the Earth. These truths, and more, can be used as a

foundation for science.

I want to take a moment to emphasize just how important are some of the truths mentioned above. Consider God's command to humans to fill the Earth and subdue it (Genesis 1:28). As innocuous as this command may seem, it is hugely important. If God commanded humans to fill the Earth and subdue it, then we know that humans were made to interact with a real world. That means that

1. the Earth is real and not an illusion or hologram,
2. human senses are basically reliable and capable of determining the nature of the world, and
3. human reasoning can understand the way the world works.

These are not minor claims: *none of these claims can be proven independently*. We need something, like the Bible, an outside source of truth, to establish these principles for us to have a logical foundation for relying on science.

However, using truths from the Bible as a foundation for science is a one-way street. We must interpret the Bible consistently or we risk making any part of the Bible uncertain. For example, if we want to use the Bible as a foundation for science, then we must interpret the entire Bible consistently, even if those interpretations run contrary to what science tells us. After all, science is subject to falsification, the Bible is not. If we want to use Genesis 1:1 to assure us that the world exists and that we do not exist in some kind of hologram or illusion, then we must also accept the genealogies of Genesis 5 and 11, which give us an age of the Earth that is around 6,000 years old. On the flip side, if we trust the Bible in things of salvation, then we are obligated to trust it when it speaks about the history of the world again, such as the genealogies of Genesis 5 and 11. To summarize, science is falsifiable, thus it cannot be used to reinterpret the Bible, and if we trust the Bible as a source of truth for anything, then we must use the Bible to interpret our understanding of scientific facts.

Now, many will claim to not accept the Bible, thus it is unnecessary for them to use the Bible as a foundation for science. However, these people still have to address the problem of the foundation of science. Just because they do not accept the Bible does not mean that science automatically becomes a reliable source in and of itself. The problem with trying to support science without the Bible is that they lack a certain source of truth. Instead, they are left with their own intellect. However, the problem that science needs a foundation exists in any type of human thinking or reasoning. Every one of our thoughts must begin with a premise, a premise that must be accepted without

proof. If we have a premise that is based on proof, then it must be based on a premise that was accepted without proof, and so on. Thus, someone who accepts science without using an outside source of truth, such as the Bible, must use the argument that "science works" as his ultimate evidence that science is reliable. However, as we saw before, "works" and "truth" are different words. Just because a scientific idea works does not mean that it must also be true: it simply means that the idea gets results that we want. Whether or not what works is a reflection of truth is another question altogether.

Ultimately, the relationship between science and the Bible is a matter of faith. Either, we begin with the Bible, accept it as true, and use the Bible as a foundation for science, or we trust that science works and therefore it is reliable, even though such a claim cannot be demonstrated to be true. This is the foundational issue when we defend the Bible from secular science. There may be a world of other issues to consider, but it will ultimately come back to an issue of faith.