God and Science:
"Faith IN Science" or "Faith AND Science?"

Course Description: Do religious faith and science conflict? Can an intelligent person like you believe in something that you cannot see? Does science replace religion in explaining life? Can a person who is committed to God also be a competent scientist?

Course Outline:

1. Does God only "fill the gaps" of what we do not yet understand?
2. Two ways of knowing - empirical and personal knowledge.
3. Dr. Timothy Lieuwen: three starting points - atheism, agnosticism, and faith.
4. Can you find a life purpose by studying life processes?
5. Before the Big Bang - can you make sense out of the singularity?
6. The question of the "anthropic principle" - is the universe "fine-tuned" for humans?
7. Does the search for scientific knowledge reflect or reject God?
8. Is the genetic code the "language of God?"
9. Goodness, Justice, and Beauty - where do these come from?
10. The appeal of Christianity to scientists - examples of those with faith in God.
11. Interpreting the Bible book of Genesis.
12. Confirming your discoveries in communities of faith and science.

Week One

Does God only "fill the gaps" of our knowledge?

Preview

Is God's place restricted to "knowledge gaps" where we do not yet have a rational, scientific explanation? Is God only useful to explain superstition and mystery? As scientific knowledge increases, will the need for God decrease?

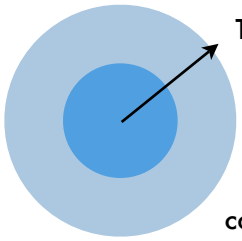
The "God of the Gaps"

This term is originally from a 19th century Christian named Henry Drummond. He criticized other Christians who looked for God in areas science could not explain: "gaps which they will fill up with God." As Drummond pointed out, this kind of "God" can only grow smaller as our scientific knowledge continues to become greater.

Dietrich Bonhoeffer also challenged the "God of the Gaps" idea. He was a Christian leader executed for opposing Hitler. Bonhoeffer wrote from prison: "Religious people speak of God when human perception is (often just from laziness) at an end, or human resources fail." Bonhoeffer said that Christians should not believe in religious superstitions. "A god who let us prove his existence would be an idol." Before Bonhoeffer was executed, he wrote, "I should like to speak of God not on the borders of life but at its center."

It is tempting to fill our "knowledge gaps" with the "God hypothesis." What about gaps in the fossil record? Does the "Cambrian explosion" of fossils point to God intervening? When French scientist Pierre Laplace was asked about God, he told emperor Napoleon, "I have no need of that hypothesis." Should our knowledge of God depend on things that we DO NOT know (our ignorance) or on things that we DO know?

The biggest problem with the "God of the gaps" approach to science and religion is this. Scientific advances will usually fill the gaps. Then science appears to be an enemy of faith. For example, Galileo was a brilliant scientist. He was also a Christian for his entire life. Through scientific observations, Galileo concluded that the earth and planets revolved around the sun. For many years, the church strongly opposed Galileo's view as contrary to the Bible. But Galileo was right. In 1992, after 350+ years, an apology was issued by Pope John Paul II. The church had interpreted Bible poetry in an over-literal way as scientific. (For example, "the sun rises, the sun sets," Ecclesiastes 1:5). So, the relationship between faith and science was damaged. In a 1615 letter, Galileo wrote: "I do not feel obliged to believe that the same God who has endowed us with sense, reason, and intellect has intended us to forego their use."



The "God of the Gaps" approach looks for God's intervention beyond the boundaries of our scientific knowledge. Someone has observed, "As the RADIUS of what we discover grows, the CIRCUMFERENCE - the boundary with the unknown - grows more." Scientists will always find new frontiers of knowledge to research and to explore. But, is it correct to restrict God to the same PLANE as scientific knowledge?

In the 1970's, Richard Bube claimed that Darwin's Origin of Species was the death of the God-of-the-gaps. He said that the God-of-the-gaps is not the same as the God of the Bible. The God of the Bible does not exist to fill the gaps in human knowledge. The Bible presents God as ABOVE nature, one "in whom we live and move and have our being." (Acts 17:28)

Notes:

Notes:

Does God only "fill the gaps" of our knowledge?

Job 38:1-10, 18-20, 31-33

Job is an ancient Bible book. Job and his friends debate a great mystery: Why do "good" people suffer? Job is not a scientific book. But, after Job argues with God, God points to observable nature in his response to Job.

[1] Then the LORD answered Job out of the storm. He said: [2] "Who is this that darkens
my counsel with words without knowledge? [3] Brace yourself like a man; I will question
you, and you shall answer me. [4] "Where were you when I laid the earth's foundation?
Tell me, if you understand. [5] Who marked off its dimensions? Surely you know! Who
stretched a measuring line across it? [6] On what were its footings set, or who laid its
cornerstone — [7] while the morning stars sang together and all the angels shouted for
joy? [8] "Who shut up the sea behind doors when it burst forth from the womb, [9] when
I made the clouds its garment and wrapped it in thick darkness, [10] when I fixed limits
for it and set its doors and bars in place ...

[18] Have you comprehended the vast expanses of the earth? Tell me, if you know all
this. [19] "What is the way to the abode of light? And where does darkness reside?
[20] Can you take them to their places? Do you know the paths to their dwellings?

[31] "Can you bind the beautiful Pleiades? Can you loose the cords of Orion? [32] Can
you bring forth the constellations in their seasons or lead out the Bear with its cubs?
[33] Do you know the laws of the heavens? Can you set up [God's] dominion over the
earth?

Discuss

1. What words or ideas do you not understand?
2. The Bible describes God as a spiritual Being. Why would a spiritual God ask questions about the material world?
3. Does God say he exists in the gaps of Job's knowledge of the material world, or above what Job can know about the material world?
4. Which of God's questions to Job have been answered by scientific discoveries?
5. Which of the questions cannot be answered by scientific discoveries?
6. Which of these diagrams illustrates what God says to Job?

Chapter Summary

We invent a "god of the gaps" to explain human ignorance or superstition.
As our human understanding increases, our need for such a "god" decreases.
The God of the Bible is not beyond what we know, but is above our understanding.

Week Two

Two ways of knowing - empirical and personal

Review

1. A "God of the gaps" is a "god" based on human ignorance or superstition.
2. A "God of the gaps" is an "idol" - an idea that we make and use to explain life.
3. As our knowledge expands, a "god of the gaps" shrinks or contracts. When scientific discoveries increase, the "gods" we use to explain the mysteries of life decrease.
4. The God revealed in the Bible is not limited by human understanding. The God of the Bible is both above and at the center of life - not pushed to the edges of what we know.
5. The Bible describes God as invisible, and spiritual. But this infinite God can freely choose to become known to us in visible, material, and finite ways.

Preview

1. Science is empirical knowledge: you measure, interpret, and verify things that you can observe.
2. But knowing God is personal. We don't just collect religious data or ideas. We can know God in a personal relationship.
3. This is true with all personal relationships - even visible, human relationships.

Knowing Things and Knowing Persons

Science is based on observation and experiments that test a hypothesis. When a hypothesis is verified, it becomes a generally-accepted theory to explain HOW physical and material things happen. Scientific method says that theories must be based on empirical data. Theories of the Big Bang, relativity, evolution, gravitation all claim to be empirically based. Scientists are always seeking to collect and "master" observable data. The God of the Bible encourages this type and process of knowing.

But knowing a person well is different than "understanding data." In personal relationships, you also observe, but you can never "master" or "explain" a relationship completely. In the Bible knowing God is not theoretical, but personal. "Now this is eternal life: that they may know you, the only true God, and Jesus Christ, whom you have sent." (John 17:3)

This is true in all personal relationships! As you grow in knowing another person, you observe HOW they act and WHAT they do. You discover WHY they do things. You begin to learn their motives and purposes. But your husband, wife, or friend can surprise you! This is true with visible relationships. It is even more true in knowing God. You cannot "master" or be an "expert" on the one you love! In biology (study of bios=life), or geology (study of geos=earth), you are over your subject. But in theology (knowing theos=God) you are under than your Subject. You must be a life-long learner. Your knowledge of God can be true, but it can never be complete.

So, how can you personally know an infinite, spiritual, invisible God you cannot observe? Only if God makes himself known. The Bible says God is revealed in three finite ways:

- COSMOS: Through the universe God made. (Just as you can learn clues about artists from their works of art). But you must be open to the hypothesis that, "there is a Maker."
- BIBLE: Through hearing the Word that God has given.
- HISTORY: Through learning from Jesus Christ, who was sent into the world to reveal God.

Notes:

Two ways of knowing - empirical and personal

Notes:

Psalm 19:1-14

The Bible book of Psalms is a book of poetry - not astronomy or science! The Psalms are prayers, meditations, and wisdom about God. This Psalm describes 2 ways that God is revealed. But does it also suggest a third way?

1 The heavens declare the glory of God; the skies proclaim the work of his hands.
2 Day after day they pour forth speech; night after night they display knowledge.
3 There is no speech or language where their voice is not heard. 4 Their voice goes out into all the earth, their words to the ends of the world ...

7 The law of the LORD is perfect, reviving the soul. The statutes of the LORD are trustworthy, making wise the simple. 8 The precepts of the LORD are right, giving joy to the heart. The commands of the LORD are radiant, giving light to the eyes. 9 The fear of the LORD is pure, enduring forever. The ordinances of the LORD are sure and altogether righteous. 10 They are more precious than gold, than much pure gold; they are sweeter than honey, than honey from the comb. 11 By them is your servant warned; in keeping them there is great reward. 12 Who can discern his errors? Forgive my hidden faults. 13 Keep your servant also from willful sins; may they not rule over me. Then will I be blameless, innocent of great transgression. 14 May the words of my mouth and the meditation of my heart be pleasing in your sight, O LORD, my Rock and my Redeemer.

Discuss

1. What words or ideas do you not understand?
2. Notice that Psalm 19 has "two halves." What is the subject of verses 1-4? What about verses 7-14?
3. What do "the heavens declare," according to verse 1? In verses 7-14, there is a shift in focus. What words describe God's Law?
4. In verses 11-14, what words show that knowing God is a personal relationship, and not just theoretical knowledge?

Chapter Summary

Science is based on empirical knowledge: you observe, test your hypotheses, and verify your theory. But you come to know persons (including God) based on personal knowledge, in a living relationship.

Are scientific and personal knowledge connected? A person of faith may not be a good scientist. And a gifted scientist may not be a good husband or parent. But a gifted scientist who is also a person of faith may seek higher goals and have more noble motives than public recognition and achievement.

"The study of the origins of the universe is, I believe, both a scientific and religious voyage of discovery: scientific because we use the techniques of the scientific method - exploration and deduction; religious because it contains the element of awe and wonder, and it stimulates questions about purpose and ends."[1]

[1] Rod Davies, God for the 21st Century, Russell Stannard editor. 2000, Templeton Foundation Press,

Three starting points: atheism, agnosticism, or belief in God

Review: weeks 1 and 2

1. Any "god of the gaps" is an "idol." It is a religious idea that we invent - based on ignorance or superstition - to explain the things that we do not yet know.
2. Science is based on empirical knowledge. Knowing God is a personal relationship.
3. In the Bible, God is described as spiritual, infinite, and invisible, but who chooses to reveal Himself in the cosmos, in His Word, and in history in the person of Jesus Christ.

Preview

How will you interpret the data about God? There are three options as starting points: atheism, agnosticism, or belief. The option that you choose will determine your conclusions about the evidence for God.

What do you accept as true, without proof?

Last week, we saw that you cannot explain all things on the basis of scientific knowledge. The scientific method cannot answer all of life's questions and mysteries. For example, science cannot help you build a meaningful love relationship, or find your purpose in life.

Atheism, agnosticism, and belief are three possible starting points when you interpret what discover in the cosmos, in the Bible, and history. These can be called "pre-suppositions" or "background beliefs." You assume or accept them as true before you examine the data.

Atheism says, "There is no God." Atheism says all truth must be demonstrated by reason. "If you cannot prove God exists, there is no God." This is an untested statement of faith in reason. Do you say, "I am certain there is no God"? Then you claim absolute knowledge! An argument that "proves" God becomes the ultimate truth. A "god" that you can "prove" will be smaller than your proof. You may deny the possibility of God. Or you may live as if God does not exist. But you think or act like you are your own God! Francis Collins writes, "If God is outside of nature, then science can neither prove nor disprove His existence. Atheism itself must therefore be considered a form of blind faith ... it adopts a belief system that cannot be defended on the basis of pure reason."[2] Atheism cannot be intellectually defended, unless you have absolute knowledge! But that puts you in the place of God!

Agnosticism says, "It is not possible to know if there is a God." Unlike atheism, agnosticism may be intellectually defended. An agnostic seems more humble than an atheist who says he is "absolutely certain there are no absolutes." But, as Francis Collins notes, "agnosticism should be arrived at only after a full consideration of all the evidence for and against the existence of God. It is a rare agnostic who has made the effort to do so."[3] Collins asks, "Would we admire someone who insisted the age of the universe was unknowable, and hadn't taken time to look at the evidence?"[4]

Intellectual honesty requires an agnostic to take time to investigate the possibility of God. This "hypothesis" is not just that God may exist. Can God be known in a personal way? The starting point of faith does not claim that God can be "proved" by scientific methods. Science cannot prove or disprove God. There are "God clues" throughout the cosmos. Faith comes when God speaks to your heart, both in the Bible and in history.

Notes:

presuppositions are like eyeglasses. You look at life through the lens of things that you have been taught to believe by your culture or society.

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[2] Francis S. Collins, The Language of God (Free Press, 2006), p. 165

[3] Ibid, p. 168

[4] Ibid, p. 169

Notes:

Three starting points: atheism, agnosticism, or belief in God

Romans 1:19-25

As Christianity spread throughout the world in the first century, its message came to many kinds of people. Jesus Christ was Jewish. Over centuries, the Jewish people had received God's Word (the Bible's Old Testament). The Christian message to them was "Jesus has fulfilled all of God's promises and laws." But the Christian message quickly spread to Asia, Africa, and Europe. All people search for direction, values, and explanations for life. In the book of Romans, Paul - an early Christian messenger - shows what people do with the "evidence for God" that is all around them.

19 The knowledge about God is made clear to all people, because God has made it
clear to them. 20 For since the creation of the world God's invisible qualities — His
eternal power and divine nature — have been clearly seen, being understood from
what has been made, so that people are without excuse.

21 For although people knew God, they neither honored him as God nor gave thanks
to him. But their thinking became worthless and their foolish hearts were darkened.
22 Although people claimed to be wise, they became fools. 23 They exchanged the
glory of the immortal God for images made to look like mortal man and birds and
animals and reptiles.

24 Therefore God allowed them to follow the sinful desires of their hearts to sexual
impurity for the dishonoring of their bodies with one another. 25 People exchanged
the truth of God for a lie. People worshiped and served created things rather than
the Creator — who is forever praised. Amen.

Discuss

1. Look at verses 19-20. How is the invisible God revealed in visible ways?
2. Look at verse 21. What two things are the cause of our human problems?
3. In verses 21-22, what happens to people who fail to honor and thank God?
4. What tragic "exchange" is described in both verse 23 and verse 25?
5. Most graduate students do not bow down to images of animals. What are some things people serve instead of God?
6. People everywhere look for a fulfilling life. And at all times and in all places, people act "religious" about something. Why do you think that is true?

Chapter Summary

Special Guest: Tim Lieuwen, Ph.D., P.E.
Associate Professor, Aerospace Engineering
Georgia Institute of Technology
"Atheism, Agnosticism, and Faith"

Who I am - Professionally
- Associate Professor in Aerospace Engineering
- Active research program in chemically reacting fluid mechanics, acoustics
    - Over 100 conference publications
    - 50 Archival journal publications
    - 2 books
    - 5 book chapters
    - Associate editor of 3 leading journals
    - Lead research group of 15 people, primarily Ph.D. students

Who I am - Personally
- Grew up in Christian household
- Up through early adult years, always accepted Christian beliefs
- In more recent years, as I have reflected on science and history, have spent lots of time pondering issue of belief

Science and Scientific Method: What kinds of questions CAN we answer?
- Develop methods for measuring, quantifying
- Develop general physical principles that encapsulate, explain range of observations ("theory")
- At core, we are observers

Science and Scientific Method: What kinds of questions can we NOT answer?
- First cause of universe
    - What is the ultimate source of matter, energy, motion?
- Intelligent design vs. pure realization of random forces
    - Note intelligent design does not preclude using "randomness" to achieve intelligent goals (think about ice crystal as result of random molecular collisions)
- What are the origins of life, of the universe?
- Does my life or humanity collectively have a purpose?
- Is there life after death?
- Where does "idea of God" come from?
- Where does "morality" come from?

A few Crucial Points
- Science cannot answer core, fundamental questions related to what one does and does not believe.
    - These questions are built upon your worldview, "epistemological foundation."
- Furthermore, scientists do not necessarily have better answers, or "scientifically, more credible answers" than others in liberal arts, philosophy, theology, or your average man on the street.

Three Systems We Will Consider
- Atheism – there is no God
- Belief – God exists and (Christian belief) God reaches out to us
- Agnosticism – there isn't enough evidence to be sure either way

Atheism's Compelling Points
- Note: the fact that you can't see God, measure God, etc., does not argue against God's existence (i.e., Atheism), only for Agnosticism.
- The Problem of Evil – if there is a God, why does God allow for horrific suffering, injustice?

Belief's (Faith's) Compelling Points

- Faith provides a systematic world view which "makes sense" and can explain:
  - Basic questions
    - Does life have a purpose?
    - Where does good, evil come from?
  - Observations
    - Apparent intelligence, purpose of creation
    - Radical change in individuals lives in certain instances
- Faith provides a framework for understanding your place in universe

Agnosticism's Compelling Points

- Fundamentally, basic issues of God and life's purpose are not amenable to observation – application of scientific method we cannot know for sure.
- A reasonable alternative explanation exists for points of belief. For example:

Believer	***Agnostic***
Answered prayer	Statistics
My life needs purpose	Who says life has to have purpose?
Religious experience	The wind, tiredness, trying too hard, want to believe
Intelligence in creation	Random working out of natural selection

Tim Lieuwen's Opinions

- Are these belief system's intellectually honest, internally consistent?
  - Atheism – NO
  - Belief – YES (at least assuming your belief system is, which I believe Christianity to be)
  - Agnosticism – YES
    - Personally, I continually ponder what makes me certain of my beliefs

The Problem with Agnosticism (which doesn't mean its wrong)

- You descend into the "darkness."
- Doesn't provide answers to fundamental life questions.
- Other points to ponder:
  - As scientists, we are very comfortable with uncertainty; some level of uncertainty doesn't keep you from believing.
  - Think how long it would take you to finish your PhD if you had to remove every question of uncertainty associated with your central thesis.
  - Remember: its immensely easier to tear down than build up, its easier to criticize a hypothesis than to develop a new one
  - As such, as you walk your "spiritual journey", continue to question and ask honest questions – if your belief system is true it will be able to withstand the scrutiny, but do it in a spirit of building, not destroying.

My Parting Opinions

- There is no tension between science and faith
  - They both provide "explaining power" over different kinds of observations and questions
  - Scientists should not take it upon themselves to answer questions over which scientific method cannot address
    - Point not understood by many scientists and leading scientific publications
  - Faith should not take it upon itself to explain scientific questions (my opinion).
- Atheists – how do you know there is no God?
  - Think again about your intellectual foundations

Week Four

Can you find a life purpose by studying life processes?

Preview

We have suggested a difference between <u>scientific</u> knowledge and <u>personal</u> knowledge. Things that you can learn by (scientifically) observing <u>processes</u> is different from what you learn from observing <u>persons</u>. Dr. Tim Lieuwen noted that there is no tension between Science and Faith. But there are some questions that science and the scientific method cannot answer. We will now look at one of those: Does my life (or does humanity) have a purpose? Al and Elaine LaCour will also briefly describe how they have discovered more about their purpose in life.

Observing Processes and Finding Purpose

Dr. Francis S. Collins, the head of the Human Genome Project, made a long personal journey from atheism to agnosticism to faith. He writes: "Science is the only reliable way to understand the natural world ... its tools ... can <u>generate</u> <u>profound</u> insights into material existence. But science is powerless to answer questions such as 'Why did the universe come into being? What is the meaning of human existence? What happens after we die?'... we need to bring the power of both the scientific and spiritual <u>perspectives</u> to bear on understanding what is both seen and unseen."[5] "If God exists, then He must exist outside the natural world, and therefore the tools of science are not the right ones to learn about Him."[6] Both Science and Faith seek knowledge through observation and experience. But Faith looks outside the limits of the seen and natural world.

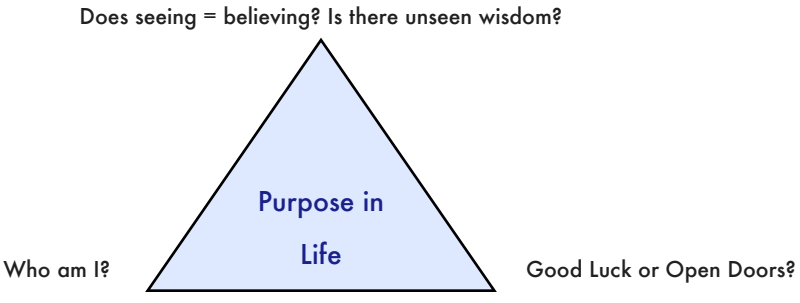
Another way to say this: SCIENCE investigates questions about HOW? in the SEEN world. FAITH explores questions of WHY? in the UNSEEN world. Dr. Collins is a man of FAITH <u>and</u> SCIENCE. So, when he published the map of the human genome, he said, "It is a happy day for the world. It is <u>humbling</u> for me, and awe-inspiring, to realize that we have caught the first glimpse of our own instruction book, previously known only to God." [7]

But can scientific answers to HOW questions give you answers for your WHY questions? No! You may observe and measure life's processes, but what if there is no purpose to life? What if there is no POINT to it everything we see in the natural world?

Two very personal journeys

Elaine LaCour: Is there any meaning in life - beyond death?

Al LaCour: Is there a plan for my life?



[5] Francis S. Collins, *The Language of God* (Free Press, 2006), p. 6

[6] ibid, p. 30

[7] ibid, p. 3

Notes:

What is the difference between a PURPOSE and a GOAL?

Goals are steps that you hope will lead you to fulfilling your purpose.

Your purpose may be "To find a cure for cancer." But you need to set goals to gain that purpose:

1. Go to university.
2. Go to medical school.
3. Do research.
4. Publish results.

What if a lifetime of chasing your goals added up to nothing?

Or, suppose you DO find a cure for cancer, but your life is still without fulfillment?

WORD MEANINGS:

<u>generate</u> = to bring an idea (or a product) into being.

<u>profound</u> = deep, penetrating, far-reaching.

<u>perspectives</u> = viewpoints, mental outlooks.

<u>humbling</u>: something that makes you modest in your view of yourself, not arrogant or prideful

Can you find purpose by studying processes?

These words are from the Bible book of *Ecclesiastes*. It is written by a teacher who has great wealth, royal power, and skillful intelligence. Tradition says the author is Solomon: the richest, most powerful, and wisest of the Old Testament kings. He first limits his observations to what is visible ("life under the sun"). Based on his observations of the visible world, he decides that there is no meaning or purpose in life.

Ecclesiastes 1:12 I, the Teacher, was king over Israel in Jerusalem. 13 I devoted myself to study and to explore by wisdom all that is done under heaven ...14 I have seen all the things that are done under the sun; all of them are meaningless, a chasing after the wind.

16 I thought to myself, "Look, I have grown and increased in wisdom more than anyone who has ruled over Jerusalem before me; I have experienced much of wisdom and knowledge." 17 Then I applied myself to the understanding of wisdom, and also of madness and folly, but I learned that this, too, is a chasing after the wind. 18 For with much wisdom comes much sorrow; the more knowledge, the more grief.

2:8 I amassed silver and gold for myself, and the treasure of kings and provinces ... 9 I became greater by far than anyone in Jerusalem before me. In all this my wisdom stayed with me. 10 I denied myself nothing my eyes desired; I refused my heart no pleasure. My heart took delight in all my work, and this was the reward for all my labor. 11 Yet when I surveyed all that my hands had done and what I had toiled to achieve, everything was meaningless, a chasing after the wind; nothing was gained under the sun.

Based on visible reality, the teacher decides all life is "chasing after wind." Now he decides to consider the possibility of God and what is unseen. The teacher observes natural life cycles. But he also speaks of purpose "under heaven."

3:1 There is a time for everything, and a season for every activity under heaven: 2 a time to be born and a time to die, a time to plant and a time to uproot, 3 a time to kill and a time to heal, a time to tear down and a time to build, 4 a time to weep and a time to laugh, a time to mourn and a time to dance, 5 a time to scatter stones and a time to gather them, a time to embrace and a time to refrain, 6 a time to search and a time to give up, a time to keep and a time to throw away, 7 a time to tear and a time to mend, a time to be silent and a time to speak, 8 a time to love and a time to hate, a time for war and a time for peace.

12:13 Now all has been heard; here is the conclusion of the matter: Fear God and keep his commandments, for this is the whole duty of man.

Discuss

1. Look at 1:12-14. What do you learn about the "teacher"? What did he decide to do?
2. Look at 1:16-18. What does "apply yourself" mean? What does he work for?
3. In 2:8-11, what were some things that the teacher gained for himself?
4. In the first three paragraphs, how does the teacher summarize his findings?
5. Look at 3:1-8 and 12:13. How does the teacher's viewpoint change?
6. The teacher spent his time and effort on knowledge, pleasure, and possessions. Why do you think he became open to the possibility of God?

Notes:

WORD MEANINGS:

Devote = to dedicate

Amass = to acquire or gain.

Survey = to observe

Toil = to work hard

Uproot = to pull up by the roots, like a plant.

folly: something that is foolish, pointless, or something that has no possibility of success - like "chasing after the wind." You can't do it!

fear of God. Does not mean "afraid", but to be filled with awe, reverence, and respect.

Before the "Big Bang" - making sense of the singularity

Preview

We have seen the difference between personal and scientific knowledge. We have asked if you can find a purpose for life by studying the processes of life. We have noted that good scientists interpret data through the "lens" of atheism, agnosticism, or faith. This week, we consider what has been called the "Big Bang." Does evidence for a "singularity" suggest that life "began?" What does that mean?

Discovery of the "Big Bang"

In the 1950's British astronomer Sir Fred Hoyle gave the name "big bang" to an idea that challenged the "steady state" hypothesis. Hoyle opposed any theory that suggested the cause of the universe was outside of the observable, material world - beyond the range of scientific inquiry.

In the early 20th century, most scientists thought the universe had no beginning and no end. Albert Einstein's relativity equations suggested a big bang. But he altered his 1916 theory of relativity and added a "cosmological constant." This was a "fudge factor" to protect his hypothesis of a "steady state" universe, that would not collapse on itself due to gravity. Einstein reportedly later called this "the greatest mistake of my life."

Big bang theories continue to gain acceptance. Scientific data confirm that the universe originated from an infinitely small volume, and expands in a predictable big bang pattern.

Big Bang Models Described

Today many variations of the big bang are studied. Instead of only "one" big bang model, new discoveries lead to newer models that answer new questions. Scientific advances will continue to refine these models. The scientific evidence for big bang theory includes: [8]

- In 1929, Edwin Hubble used the Doppler Effect to measure the rate at which neighboring galaxies recede from our own galaxy.
- The solution to equations of general relativity show the universe to be expanding from a finite beginning in the finite past. Recent measurements make general relativity the most completely tested and proven theory in physics.
- In 1948, Alpher and Herman calculated that cooling from a big bang event should yield faint background radiation. In 1965, microwave signals that represent the remaining "noise" from a big bang were detected by Penzias and Wilson.
- According to big bang models, as the universe ages and expands, it should grow cooler. Astronomers can now measure background radiation at 1/28,000th of the present age of the universe. The cooling is exactly the amount that big bang theory predicts.
- For galaxies to form out of a big bang, temperature fluctuations in cosmic background radiation should measure at about 1/100,000. Fluctuations are detected at that level.
- In 1970, Stephen Hawking and Roger Penrose developed a mathematical theorem that establishes if the universe contains mass, and if its dynamics are governed by general relativity, then time itself must be finite.[9] Time as well as space "began" at the big bang.
- Ratios and amounts of hydrogen, deuterium, and helium in the universe point to a big bang.

Notes:

Singularity - A unique point in time and space when/where the forces of gravity infinitely compress and the laws of physics break down.

Fudge factor (idiom) - To add or subtract a quantity to obtain the result from a scientific experiment that you desired or expected.

Recede - to move away from and become more distant or more faint from our observation point.

[8] From a brief overview of big bang evidence by Ross: www.reasons.org/resources/fff/2000issue03/index.shtml#beginner_expert_guide_big_bang

[9] Ibid, Quote from Dr. Hugh Ross. www.reasons.org/resources/fff/2000issue03/index.shtml#beginner_expert_guide_big_bang

Before the "Big Bang"

Notes:

Theologian - a person who studies the question of God. "Biology" looks at the reasons (logos) about life (bios). And "sociology" looks at society. So "theology" asks questions (from the world, but especially from the Bible) about "Theos" - God.

World View - the way a person perceives and interprets the world. Your view point or your outlook on life.

Oscillate - to swing back and forth.

Monotheism - (one God) a religion that believes there is only one God, who is the creator of all things.

Interpreting Big Bang Models

If time and space had a beginning, what was before that? What was before the big bang? For scientists with faith, the big bang points to a Creator outside the cosmos. For example, Astrophysicist Robert Jastrow writes: "For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries."[10] Jastrow sees no tension between science and faith. "Now we see how the astronomical evidence leads to a biblical view of the origin of the world. The details differ, but the essential elements and the astronomical and biblical accounts of Genesis are the same; the chain of events leading to man commenced suddenly and sharply at a definite moment in time, in a flash of light and energy." [11]

But your conclusion will depend on your world view: atheism, agnosticism, or faith.

Atheism depends on blind faith that cannot be intellectually defended. If God exists outside of nature, then science cannot prove or disprove God exists.

A *Judeo-Christian* world view says that an "arrow of time" points in the direction of the universe's expansion. The universe will end either from a "big chill" (more expansion) or from a "big crunch" (the arrow is reversed by gravitation; everything collapses).

Does the cosmos expand or oscillate? The *Buddhist* world view may seem to be less compatible with the idea of a finite universe that has "a beginning and an end."

Hinduism is not monotheistic. It does not draw a sharp boundary between material and spiritual reality. "But the theistic branches of *Hinduism* encounter no major conflict with the Big Bang. Neither do most (but not all) interpreters of *Islam*."[12]

There are some questions that each person must ask. What answers will we find to:

- Did the universe always exist?
- Will the cosmos continue to expand and contract?
- Does a big bang model *require* a creator?
- Simple, elegant, universal equations derived by Einstein, Hawking, point to a big bang model of origins. Are they signposts to greater intelligence: the mind of God?

The Bible and the Big Bang - do they agree?

Genesis 1:1-1: "In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters."

Hebrews 11:3: "By faith we understand that the universe was formed at God's command, so that what is seen was not made out of what was visible."

Psalm 8:3-4 "When I consider your heavens, the work of your fingers, the moon and the stars, which you have set in place, what is man that you are mindful of him ... that you care for him?"

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[10] R. Jastrow, *God and the Astronomers* (New York: W.W. Norton, 1992), 107.

[11] Ibid, p. 14

[12] Collins, ibid, p. 82

Is the universe "fine-tuned" for humans?

Preview

Does scientific evidence suggest that the universe was "fine tuned" to sustain life on our planet? If certain observable, measurable factors changed slightly, human life would be impossible. Some scholars argue that this suggests that the universe was purposely designed to support human life. Others disagree.

Statement of the Argument

The "fine-tuned universe" argument says that even very small changes to about 20 physical constants would make the universe radically different than what we experience today. Human life could not have existed if any of these factors were changed - to the smallest degree.

Some scientists, persons of faith, see these factors as evidence for the existence of God. Believing scientists claim the universe has an "intelligent design" to sustain human life.

What is the scientific evidence?

We can only give a brief summary of "anthropic" evidence for a "fine-tuned" universe:

- Just after the Big Bang, if "matter" and "anti-matter" had existed in equal amounts, the universe would now be pure radiation - no people. But, for every billion of quarks and anti-quarks, there was an extra quark: a small fraction that is the mass of the universe.
- Fine-tuning of the mass / energy / gravitational constant of the expanding universe? "If the rate of expansion one second after the Big Bang had been smaller by even one part in 100 thousand million million, the universe would have re-collapsed before it ever reached its present size." [13] Hawking also writes, "It would be very difficult to explain why the universe should have begun in just this way, except as the act of a God who intended to create beings like us." [14]
- The formation of heavy elements. "...the cosmos is not at all hostile to life. Our existence depends on "the occurrence of many coincidences ... matter is ruled by a subtle balance between the laws of nature that made stars able (through nuclear fusion) to form in gas clouds and to gently cook heavy elements, such as carbon, nitrogen, and oxygen - elements essential for the later development of life."[15] If the nuclear force had been weaker or stronger, only hydrogen or helium could have formed.
- There are 15 physical constants that are "givens." These include the speed of light, strong and weak nuclear forces, electromagnetic constants, and the force of gravity. These are "constants" in the cosmos. The values are exactly what is needed for complex life forms.

What are the optional conclusions?

Francis Collins lists 3 alternatives. Which ones are from faith - atheist - agnostic viewpoints?

- There may be an infinite number universes from random chance: there are "multi-verses."
- There is only one universe. It happens to have the right factors. We are very, very lucky.
- There is only one universe. But the "precise tuning" that makes intelligent life possible is not an accident. It is because of the purpose and action of a Creator.

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[13] Stephen Hawking, *A Brief History of Time,* (New York: Bantam Press, 1998), p. 210

[14] ibid, p. 144

[15] Bruno Guiderdoni in *God for the 21st Century,* Russell Stannard, editor (London, SPCK), p. 22

Notes:

Anthropic - relating to humans or the era of human life. From the Greek word anthrōpos, for "human being."

Notes:

Tautology (from logic) - You restate the same thing in 2 different ways. A statement that is only true because it says the same idea twice: "It will rain tomorrow, or it will not rain tomorrow."

Theists and non-theists: those who believe in God or do not believe in God (Theos).

Is the universe "fine-tuned" for humans?

What do some scientists conclude?

- Arno Penzias, a Nobel prize-winner who co-discovered the cosmic microwave "background noise" from the Big Bang says, "The best data we have are exactly what I would have predicted had I nothing to go on but the five books of Moses, the Psalms, the Bible as a whole." [16]
- Freeman Dyson, physicist, concludes: "The more I examine the universe ... the more evidence I find that the universe in some sense must have known we were coming."[17]
- American physicist John Wheeler: "A life-giving factor lies at the center of the whole machinery and design of the world." [18]
- "The bottom line is that the universe is at least ten billion orders of magnitude (a factor of $10^{10,000,000,000}$ times) too small or too young for life to have assembled itself by natural processes. These kinds of calculations have been done by researchers, both non-theists and theists, in a variety of disciplines." [19]

How is the "fine-tuned" argument criticized?

- First, critics say this uses scientific data to re-state an old "argument from design." Since all causes have effects, design must come from the existence of a designer. For example, William Paley's famous "watch and watchmaker" argument.
- Second, some see "anthropic bias." We are human, so our scientific observations are biased (we prefer) human life forms. To claim a "fine-tuned universe" shows a lack of imagination. We assume that no other forms of life are possible.
- Third, critics say the fine-tuned universe idea is a tautology: "Life as we know it may not exist if things were different." But "a different sort of life might exist in its place."

What does the Bible say?

The Bible is not a book of modern science, biology or astrophysics. But the Bible does reveal an "anthropic bias." Based on scientific observation, there is no center or special position in the universe. But, according to the Bible, God's purpose as Creator was to reveal and reflect his glory in human beings, his most noble and complex creatures.

Psalm 115:1,3-4,16: "Not to us, O LORD, not to us but to your name be the glory, because of your love and faithfulness ... Our God is in heaven; he does whatever pleases him. But their idols are silver and gold, made by the hands of men ... The highest heavens belong to the LORD, but the earth he has given to man."

Hebrews 2:6-8: "What is man that you are mindful of him, the son of man that you care for him? You made him a little lower than the angels; you crowned him with glory and honor and put everything under his feet."

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[16] A. Penzias in M. Browne, "Clues to the Universe's Origins Expected," New York Times, March 12, 1978. Quoted by Francis Collins

[17] Quoted by Francis S. Collins, *The Language of God* (Free Press, 2006), p. 76

[18] Wheeler, John. Foreword to *The Anthropic Cosmological Principle* by John D. Barrow & Frank J. Tipler. (Oxford, U. K.: Clarendon, 1986), p. vii.

[19] Quote from Dr. Hugh Ross, www.reasons.org/resources/apologetics/design.shtml#01

Does Science Reflect, or Reject, God?

Preview

Some people think that scientific knowledge will lead to the rejection of God. It is assumed that scientific discoveries will eliminate all religious superstitions. But, in the Bible, God gives dignity and delegates scientific work to humans.

Why is Christianity not an enemy of science?

It is certainly true that some Christians have either feared or avoided science. It is also true that some scientists are against Christianity. But the Bible makes clear that the search for scientific knowledge is approved and honored by God. The Bible makes two main points that lead to this conclusion.

The Dignity of the Scientist is to reflect God

In many ancient cultures, only the king or emperor had the supreme honor and dignity. The king's rule reflected God's rule. The ruler was God's image. Other people were subject to the ruler. But the Bible makes a surprising claim. All people are made in God's image. The dignity of every person is to "rule" over the rest of God's creation.

Note this from the first chapter of the Bible:

"[26] Then God said, 'Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground.' [27] So God created man in his own image, in the image of God he created him; male and female he created them." (Genesis 1:26-27)

This honor and dignity is not reserved for scientists, but is given to all human beings. God has placed us in a position that is "over" the rest of nature. How people use - or abuse - this privileged position will either improve our lives, or destroy our lives on the earth.

Blaise Pascal (1623-62) was a brilliant mathematician and philosopher. Pascal published a work on conical sections when he was 16 years old. He invented a calculator by 19 years old. With Pierre de Fermat, he formulated the modern theory of probability. He provided the basis for the hydraulic press (Pascal's Law) and he proved there was a vacuum above the atmosphere. Blaise Pascal was also a committed Christian. He commented that, *"Man is neither angel nor beast."*

Another Frenchman, Henri Blocher[20], summarizes the Bible's teaching about humans with two observations: 1) Mankind is only an image of God. The word "human" is traced back to the latin word "humus," which is also the root of the word "humility." As human beings, we are not God - but only God's image.

But note that 2) Only mankind is in God's image. While we are dependent creatures, we have more honor of any form of life on earth. God is an infinite, eternal spiritual being. Though we are finite, temporal, and physical beings - we can resemble and reflect God.

As image-bearers of God, scientists should be humble: we are not ultimate. But scientists are honored. We can stand "over," inspect, study, and examine the rest of the universe.

Notes:

Dignity - a person's honor, respect, position.

Delegate - to authorize or empower someone to act as your personal representative.

[20] Henri Blocher, *In the Beginning: the opening chapters of Genesis,* (Leicester, England: Inter-Varsity Press, 1984), pp. 82-83

Notes:

Suitable helper - this is difficult to translate from the original Hebrew language. The word suitable has the idea of "alongside - with - opposite - counterpart." Helper is one who intervenes to sustain. Robert Alter, a Hebrew scholar translates this as a "sustainer beside him."

The man said- The words that follow are the oldest "love poem" in history. The first time that a man speaks in the Bible is when he has found a person to respond to.

Woman - Genesis names "*Adam*" in relation to the ground (*adamah* = earth). But Adam names "*woman*" in relation to himself (*issa* = woman, taken out of *is* = man). Adam recognizes and rejoices that his wife is his special counter-part.

The Work of the Scientist is Delegated by God

Here is one of the most remarkable parts of the Bible, from Genesis 2:18-24:

"18 The LORD God said, 'It is not good for the man to be alone. I will make a helper suitable for him.'
19 Now the LORD God had formed out of the ground all the beasts of the field and all the birds of the air. He brought them to the man to see what he would name them; and whatever the man called each living creature, that was its name. 20 So the man gave names to all the livestock, the birds of the air and all the beasts of the field. But for Adam no suitable helper was found. 21 So the LORD God caused the man to fall into a deep sleep; and while he was sleeping, he took one of the man's ribs and closed up the place with flesh. 22 Then the LORD God made a woman from the rib he had taken out of the man, and he brought her to the man.
23 The man said, 'This is now bone of my bones and flesh of my flesh; she shall be called 'woman,' for she was taken out of man.' 24 For this reason a man will leave his father and mother and be united to his wife, and they will become one flesh."

Discuss

1. Are there any words or ideas you do not understand?
2. According to verse 18, what was incomplete in the world?
3. What does God decide to do?
4. Look at verses 19-20. What does God "delegate" to the man to do?
5. How does Adam look like a scientist? What does Adam look for?
6. At the end of verse 20, what has been decided? Who came to this conclusion?
7. Verses 21-22: How does the man find a counterpart? What does Adam say?
8. Look at verse 24. How is this story applied to family relationships?

"What relationship does the man establish with the animals? He *names* them ... The man must in fact study the character of the animals which pass before him, in order to see whether any one of the birds or animals can bring him the company he desires. The name he gives summarizes his conclusion ... (This) ... almost humorous scene suggests a rudimentary kind of science, the means of man's domination over nature ... By naming, the man demonstrates his power of distinguishing things..." Henri Blocher, p. 91

Chapter Summary

Science can Reflect God - because only humans are in God's image. Scientific research is honorable. We stand "above" and "alongside" the rest of the universe - so that we can discover things about all of life.

But scientists cannot Replace God - because humans are only God's image. Scientific research must be humble. Our scientific discoveries are God's creations.

Week Eight

Is the genetic code the "language of God?"

Preview

Since the 1980's, there have been major scientific efforts to "map" the human DNA sequence. By June, 2000, 85% of the human genome was decoded. President Bill Clinton announced, "Today we are learning the language in which God created life. We are gaining ever more awe for the complexity, the beauty, and the wonder of God's most divine and sacred gift." Was that a religious statement? Yes. But was it unscientific? Dr. Francis S. Collins, the head of the Human Genome Project, added, "It is humbling for me, and awe-inspiring, to realize that we have caught the first glimpse of our own instruction book, previously known only to God."

The Road Map of Life

The Human Genome Project was a $3-billion project officially started in 1990, funded by the U. S. Department of Energy and the National Institutes of Health. In Great Britain, funding came from London's Wellcome Trust. The Project was expected to last for 15 years. Laboratories from six countries were involved: the U. S., China, France, Great Britain, Germany, and Japan. It was truly an international project.

A complete map of the human genome was something with great potential. The map would be like a "parts list" for human life. The DNA sequence might reveal clues about the genetic basis for diseases like cystic fibrosis and Huntington's disease. Watson and Crick published the discovery of the DNA "double helix" in 1953. In an announcement 50 years later, scientists with the Human Genome Project estimate there are 20-25,000 genes in the "road map."

What were the most significant or surprising findings?

- Scientists had expected to find at least 100,000 human genes. But Francis Collins notes, "many of us were stunned to discover that God writes such short stories about humankind."[21]
- Human life is complex. And yet simpler life forms - like worms, flies, and plants - are in the same range of 20-25,000 genes. So, human complexity cannot be explained by a higher "gene count." As Francis Collins notes, the average educated English speaker has a vocabulary of about 20,000 words. But a person can use the same amount of words to write a simple document or a complex work of literature.
- When you compare all of the members of our species, humans are all 99.9% identical. Other species are more diverse genetically. So, all humans are close relatives. We are members of one family. It seems we have descended from a common set of founders. The fossil record points us toward East Africa as the location of our "common ancestors."
- Comparing DNA sequences in humans and primates continues the debate over evolution. Chimpanzee and human "gene maps" are 96% identical. Genetic diversity between chimpanzees is about 10 times the difference between humans. Darwin suggested that evolution is by "natural selection." Evolutionists claim that non-coding DNA ("junk DNA") gives evidence of random bio-chemical events, imperfections in nature. Others disagree. "... the more we learn about genomes, the more we recognize the diverse functional importance of 'junk' DNA. At the same time, we uncover more evidence for Design." [22]

Notes:

[21] Francis S. Collins, *The Language of God* (Free Press, 2006), p. 125

[22] Fazale R. Rana, Ph.D., *Yet Another Use for "Junk" DNA*, www.reasons.org/resources/fff/2000issue03/index.shtml#junk_dna

Is the genetic code the "language of God?"

Notes:

Note these two different Hebrew words:

Created: אָרָב = BARA (used only of God, who creates out of nothing)

Made: עָשָׂה = ASAH (to make something from pre-existing materials)

Breathed: How does this passage from Genesis 2 give special meaning to this from John 20:21-22:

"Again Jesus said, 'Peace be with you! As the Father has sent me, I am sending you.' And with that he breathed on them and said, 'Receive the Holy Spirit.'"

- What does the act of "breathing" claim about Jesus Christ?
- What is the meaning of God's gift of the Holy Spirit to those who believe in and follow Jesus Christ?

Why are humans somewhat *similar* to other species?

Notice this Bible passage from Genesis 2:4-7:

"2:4 This is the account of the heavens and the earth when they were created (אָרָב).
When the LORD God made (עָשָׂה) the earth and the heavens — 5 and no shrub of the field had yet appeared on the earth and no plant of the field had yet sprung up, for the LORD God had not sent rain on the earth and there was no man to work the ground, 6 but streams came up from the earth and watered the whole surface of the ground — 7 the LORD God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being."

One believing scientist says that similar gene structures would be "... expected since humans and great apes share so many anatomical and physiological characteristics ... Why wouldn't a Creator designing organisms to share physical similarities build them from similar raw materials?" [23] Physically, we share the "raw material" (the dust of the ground) with other animals. But, spiritually and mentally, we are different...

Why and how are humans *different* from other species?

Animals received "breath of life" from God. Humans are similar in physical ways, but we differ spiritually from other species. Our gene structures may differ only slightly in *degree* from chimps, but differ greatly in *kind*. According to the Bible, our mental and spiritual differences with other species depend on more than gene structure.

The human brain is very different between chimpanzees and humans. Genes needed for language, hearing, and brain capacity are much different for humans than chimps. "Humans ask, What is the nature of the universe? What is our place in it? Where did the universe and its life forms come from? Why is everything the way it is?" [24]
Why do we ask "Why?" What explains our human curiosity and thirst for knowledge?

What explains our moral sense of right and wrong? Why do we have value systems? "It is extremely difficult to be a normal human being and not think that some actions are wrong and some are right." [25] Why do all human societies pass laws to regulate behavior? Why do we expect ethical conduct? Why do humans have a conscience? Why do we appreciate beauty in art, music, film, literature, and the natural world? Why do only humans - of all the animal species - study our own DNA?

What does the Bible say about a shared human ancestry?

Acts 17:26-27 says "26 From one man (God) made every nation of men, that they should inhabit the whole earth; and he determined the times set for them and the exact places where they should live. 27 God did this so that men would seek him and perhaps reach out for him and find him, though he is not far from each one of us."

Humans are not "just another animal." Only humans were created in God's image (Genesis 1:26-28). As humans, we resemble God our Creator - intellectually, morally, and spiritually in finite ways.

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[23] Fazale R. Rana, Ph.D., *Humans and Chimps Differ,* www.reasons.org/resources/connections/2001v3n3/index.shtml#humans_chimps_differ

[24] Stephen W. Hawking, *A Brief History of Time* (New York: Bantam Books, 1988), 171.

[25] Alvin Plantinga, *Right and Wrong, in Great Thinkers on Great Questions,* ed. Roy A. Varghese (Oxford: Oneworld Publications, 1998), 102.

Week Nine

Goodness, Justice, and Beauty - where do they come from?

Preview

Certain facts of human experience are difficult to explain by science. Why do we admire a person who makes an unselfish personal sacrifice for someone? (What is GOOD?) Why do we talk about right and wrong? Why do we want wrong behaviors to be punished and right behaviors rewarded? (What is JUST?) Why do we call a sunset "lovely"? Why do we say that a mountain is "majestic"? Why are certain things "awe-inspiring" to us? (What is BEAUTY?) This sense of goodness, justice, and beauty are not found in animals. Why?

Is Truth Objective - or only Subjective?

Ancient philosophy claimed that virtues like goodness, justice, and beauty are absolutes. Plato said immortal human souls experience reflections of these ultimate, objective realities.

Christianity does not teach that these virtues are eternal. Goodness, justice, and beauty are attributes of the eternal God. We experience these as we relate to God. The Bible says, "Whatever is true, whatever is noble, whatever is right, whatever is pure, whatever is lovely, whatever is admirable – if anything is excellent or praiseworthy – think about such things." (Philippians 4:8) Are human experiences of nobility, rightness, purity, loveliness, and admiration based on *eternal virtues*, based on *God*, or based only on our *feelings*?

Immanuel Kant called himself a Christian, but his thinking was hostile to religion. For Kant, truth and religion are subjective, not objective. Kant wrote: "Two things fill me with wonder: the starry sky above and the moral law within." This is not a statement of religious belief. Kant describes human feelings and emotions. "*The starry sky above* is the physical universe as known by modern science ... The moral law is not without but *within*, not objective but subjective." [26] For Kant, ethical behavior must be based on a "categorical imperative" - "So act that your principle of action might safely be made a law for the whole world." So, moral behavior must based on your own sense of reason and duty to other people.

Is there objective truth? When we are *filled with wonder,* is there any basis in reality? Or, are goodness, justice, and beauty only emotions produced by our genes and hormones?

In your own life experience and from your own culture ...

What is the SOURCE, STANDARD, and the MOTIVATION for these human experiences?

	Goodness	Justice	Beauty
Source?	?	?	?
Standard?	?	?	?
Motivation?	?	?	?

[26] Peter Kreeft, article: *"The Pillars of Unbelief – Kant" The National Catholic Register,* (January - February 1988)

Notes:

sacrifice: to give up something valuable, like your money, time, or even your life, to benefit another person.

majestic: something that is big, powerful, and impressive.

subjective: something that that only exists in a person's mind, not in the external world. Based on inner feelings, not facts.

objective: something that is based on facts and observable data.

categorical imperative: something that should be an obligation for all people, in all places.

Notes:

Goodness, Justice, and Beauty - where do they come from?

Can evolution explain moral duty?

All people and world cultures have a sense of moral duty. C. S. Lewis argues that this "Moral Law" is universal - and points us to the reality of God. "... just as all bodies are governed by the law of gravitation and organisms by biological laws, so the creature called man also had *his* law - with this great difference, that a body could not choose whether it obeyed the law of gravitation or not, but a man could choose either to obey the Law of Human Nature or to disobey it ... They know the Law of Nature; they break it ... The law of gravity tells you what stones do if you drop them; but the Law of Human Nature tells you what human beings *ought* to do and do not. In other words, when you are dealing with humans, something else comes in above the actual facts." [27]

Where does this universal Moral Law come from? Science can observe the way things operate in *physical nature* (gravity will cause an object to fall). But what about the way that *human nature* operates? We all feel a "pull down" to disobey universal laws of morality. Why do humans try to "live up" to a higher standard than the animals? How do some people resist the forces of selfishness? Why do we most admire the people who live in an honorable, loving, and self-sacrificing way?

For a scientist who is a Christian like Francis S. Collins, evolution can never explain such behavior. "If you believe ... natural selection operates on the individual, not on a group, why then would an individual risk his own DNA doing something selfless to help somebody in a way that might diminish his own chances of reproducing? ... We might help our own family members because they share our DNA. Or help someone else in expectation that they will help us later... (but) the most generous manifestations of altruism ... are not based on kin selection or reciprocity." [28] "When we see that kind of love and generosity, we are overcome with awe and reverence." [29]

Altruism - An unselfish concern for the good of other people; putting the needs of other people above your own self-interests.

Thought Question: Do you believe that humans are NATURALLY selfish or unselfish?

The Apostle Paul, the writer of much of the Bible's New Testament, said: *I have the desire to do what is good, but I cannot carry it out. For what I do is not the good I want to do; no, the evil I do not want to do–this I keep on doing.* (Romans 7:18-19)

Awe-inspiring examples

We admire and respect those people who have put the interests of others over their own personal interests. Why do some people risk their own lives, or go to personal expense - to help others without any repayment in return?

- The German industrialist Oskar Schindler risked his life and spent his own money to save more than a thousand Jews from the Nazi gas chambers.
- The Roman Catholic nun Mother Theresa chose a life of poverty to give herself to the sick and dying.
- What are some other examples in your own experience?
- "When we were still powerless, Christ died for the ungodly. Very rarely will anyone die for a righteous man, though for a good man someone might possibly dare to die. But God demonstrates his own love for us in this: while we were still sinners, Christ died for us." (from the Bible, Romans 5:6-8)
- "This is how we know what love is: Jesus Christ laid down his life for us. And we ought to lay down our lives for our brothers." (from the Bible, 1 John 3:16)

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[27] C. S. Lewis, *Mere Christianity*. (New York: Macmillan Publishing Company, 1943, 1945, 1952), pp. 4, 7, 14.

[28] Francis S. Collins, article - debate on *God Versus Science,* Time Magazine, November 13, 2006, p. 54.

[29] Francis S. Collins, *The Language of God* (Free Press, 2006), p. 25.

The Appeal to Christianity to Scientists

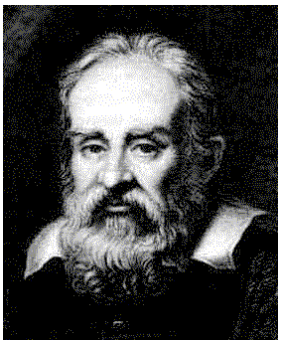
Preview

Christianity and Christians have been leaders in the development of modern science. We will look at some notable examples. One scientist will describe Christianity's appeal to him personally.

Augustine of Hippo (A.D. 354-430)

While not a scientist, Augustine was one of the great minds of the early church. His *Confessions is* the first autobiography of personal human failure and sin. It is considered an early human psychology. His *City of God* was a philosophy of history and its relationship to the kingdom of God. Writing on *Genesis,* Augustine said Christians should not treat the Bible as a book of scientific explanations. Newer discoveries always overturn wrong Bible interpretations. But this also causes people to doubt the truth of the Bible and ridicule Christianity.

Galileo Galilei (1564-1642)



Galileo was an astronomer and mathematician who demonstrated that the velocity of a falling body does not depend on its weight. He built the first telescope and laid a foundation for Newton's laws of motion. When he confirmed the Copernican solar system, the Roman church denounced his views. He was put on trial, and was forced to deny his belief that the planets revolved around the sun. Not until 1993 did the Vatican officially recognize the validity of Galileo's findings. In spite of church opposition, he was a life-long Christian. Galileo wrote, "I do not feel obliged to believe that the same God who has endowed us with sense, reason, and intellect has intended us to forego their use."

Sir Isaac Newton (1642-1727)

Newton is called the father of modern science. He studied mathematics and the laws of nature, and defined the laws of gravity and planetary motion. He developed differential calculus. In his later years, Newton wrote more works on the Bible than science. Newton wrote, "This most beautiful system [the universe] could only proceed from the dominion of an intelligent and powerful Being."

Thomas Bayes (1702–1761)

Bayes set out a theory of probability in 1764. His conclusions were accepted by Laplace in 1781, rediscovered by Condorcet, and were not challenged until questioned by Boole. An amateur mathematician, his writings were rediscovered in the 20th century. Bayesian statistics is a branch of stochastic mathematics. Ironically, Thomas Bayes was a Presbyterian minister and the pastor of an English country church.

Notes:

The Appeal to Christianity to Scientists

Notes:

Bible Passages

There are 66 books of the Bible, written over almost 1,600 years, by more than 40 human authors. But the Bible has one unified message. As we have noted, ancient literature like the Bible cannot be a textbook of modern science. The books of the Bible contain history, poetry, biography, law, wisdom and prophecy - all different forms of literature. Christians believe that the Bible is God's Word, and so completely true. Here are some Bible passages. These are not "scientific" statements. But are these true? Do these contradict modern science? What do you think?

Read and Discuss

Genesis 1:1-3: [1] In the beginning God created the heavens and the earth. [2] Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters. [3] And God said, "Let there be light," and there was light.

Genesis 2:19-22: [19] Now the LORD God had formed out of the ground all the beasts of the field and all the birds of the air. He brought them to the man to see what he would name them; and whatever the man called each living creature, that was its name. [20] So the man gave names to all the livestock, the birds of the air and all the beasts of the field. But for Adam no suitable helper was found. [21] So the LORD God caused the man to fall into a deep sleep; and while he was sleeping, he took one of the man's ribs and closed up the place with flesh. [22] Then the LORD God made a woman from the rib he had taken out of the man, and he brought her to the man.

Psalm 8:3-9: [3] When I consider your heavens, the work of your fingers, the moon and the stars, which you have set in place, [4] what is man that you are mindful of him, the son of man that you care for him? [5] You made him a little lower than the heavenly beings and crowned him with glory and honor. [6] You made him ruler over the works of your hands; you put everything under his feet: [7] all flocks and herds, and the beasts of the field, [8] the birds of the air, and the fish of the sea, all that swim the paths of the seas. [9] O LORD, our Lord, how majestic is your name in all the earth!

Hebrews 11:3: [3] By faith we understand that the universe was formed at God's command, so that what is seen was not made out of what was visible.

John 20:25-31: [25] The other disciples told [Thomas], "We have seen the Lord [Jesus]!" But [Thomas] said to them, "Unless I see the nail marks in his [Jesus'] hands and put my finger where the nails were, and put my hand into his [Jesus'] side, I will not believe it." [26] A week later his disciples were in the house again, and Thomas was with them. Though the doors were locked, Jesus came and stood among them and said, "Peace be with you!" [27] Then he said to Thomas, "Put your finger here; see my hands. Reach out your hand and put it into my side. Stop doubting and believe." [28] Thomas said to him, "My Lord and my God!" [29] Then Jesus told him, "Because you have seen me, you have believed; blessed are those who have not seen and yet have believed."

[30] Jesus did many other miraculous signs in the presence of his disciples, which are not recorded in this book. [31] But these are written that you may believe that Jesus is the Christ, the Son of God, and that by believing you may have life in his name.

The Appeal of Christianity to a Scientist, John A. McIntyre (reprinted with the author's permission)

I first worked with university students in the early 1970's. At the time, I often distributed a small booklet to students wanting to explore the relationship between Christianity and science. The author was John A. McIntyre. The booklet was *The Appeal of Christianity to a Scientist* (Inter-Varsity Press, 1974, currently out of print.) The booklet was a reprint of an article published in *Christianity Today* (March 15, 1968).

After graduate school, I was privileged to know "Jack" McIntyre in person. In fact, I was his pastor - at Westminster Presbyterian Church in Bryan, Texas. Dr. McIntyre was a professor of physics and the associate director of the Cyclotron Institute at Texas A & M University. He earned the B. S. from the University of Washington and the M. A. and Ph.D. from Princeton. He previously taught at Yale.

Jack is a great lover of the Bible and Science. We have not always agreed on every interpretation of the Bible and Science. But Jack impressed me with a great insight: "Good theology does not justify bad science." A firm belief in the Bible as God's Word does not give me an excuse to be guilty of lazy thinking about scientific inquiry. I am grateful for Jack's wisdom and his permission to reprint his article. I have clarified [ ] words for 2nd language students. This course is dedicated to my friend Jack.

We are sometimes told that the modern mind cannot accept the 2,000-year-old Gospel of Jesus Christ. I first heard the Gospel [the good news of Christ] as a practicing physicist, and I find this opinion about the "modern mind" hard to understand. For when I first examined the gospel message I found it appealed to me in the same way that physics had first appealed to me. In fact, I concluded that my training as a physicist had given me a viewpoint and a manner of thinking that made acceptance of the Gospel particularly easy.

The way I began to study the Bible was through a Bible class in a home. Here, for the first time in my experience, the Bible was examined seriously. I'd been brought up in a church where the Bible was up on the pulpit, but somehow the preacher and the congregation never really got into what it said. The people in the class took it seriously, and I found that they looked at the Bible in the same way that I looked at nature in a laboratory. It was considered to be reliable and important. If something didn't seem quite right, they didn't throw the whole thing away. They studied it carefully, compared different parts, cross-checked things, just as the scientist does in the laboratory. The difficulties were taken as a basis on which to learn more. Everyone seemed to believe that problems could lead to new understandings.

Now, this is a very scientific point of view. Professor P. A. M. Dirac, winner of a Nobel Prize for his work in quantum mechanics, makes this clear in commenting on the quantum theory:

> I should now like to dwell a bit on the difficulties in physics in the present day. The reader who is not an expert in the subject might get the idea that because of all these difficulties physical theory is in pretty poor shape and that quantum theory is not much good. I should like to correct this impression by saying that the quantum theory is an extremely good theory. It gives wonderful agreement with observation over a wide range of phenomena. There is no doubt that it is a good theory, and the only reason physicists talk so much about the difficulties is that it is precisely the difficulties that are interesting. The successes of the theory are all taken for granted. One does not get anywhere simply by going over the successes again and again, whereas, by talking over the difficulties people can hope to make some progress.

Scientists have learned to live with difficulties; we expect them. The difficult things in Scripture were not the problem for me that they are for many people.

As as result of this inductive Bible study, I also saw the Bible message as a whole for the first time. Now it is hard for me to see how anybody can miss it, though I did for many years. The message is simply that back in the beginning (and we don't know the details at all), man turned away from God. He was made to be in fellowship with God, but he rejected this fellowship. We have the story of the Garden of Eden. We see over the centuries how rejection of God got man into trouble over and over again. But God, who created man in his own image and loves him, determined to do something to restore this fellowship. He did this by coming himself. We say by "sending his Son," but after all God and the Son are the same [God]. He came himself, though in a sense that we don't really understand. He didn't pick somebody else to bear this burden but came himself and took on himself the punishment deserved by man. Because of this we can once more have good relations with God; we can have a new birth. We can be new people, no longer out of fellowship with God, no longer estranged from him.

Then we go on, and at the end of the Bible we have the Tree of Life again; we have God and Satan, the same cast we saw at the beginning, and the drama is completed. Those who are in fellowship with God are united with Him forever. It's a tremendous - let me use the word - "theory." It encompasses history; it encompasses our own lives, our own thoughts. It explains the tragic history of man - terribly clever, yet somehow never able to prevent things from falling into ruin. Most convincing of all, we see a change in the lives of those who have become new creatures in Christ.

It was the attractiveness of this very comprehensive and beautiful theory, plus the fact that everywhere that I could test it n my own experience it rang true, that led me to become a Christian. There are difficulties. But this theory certainly explained a lot of things. A scientist doesn't throw away a good theory because of a few difficulties.

I think that at this point it is perfectly understandable for people to demur. They can say, "well, you're not very objective. You accepted this theory just because it seemed like a nice theory. Isn't that wishful thinking? Are you going to believe in things simply because they are appealing?"

Let me appeal to scientific advances that are based on precisely this principle, that we want the world to be very nice and pleasant and that it's right to construct theories that are this way. The first example is Einstein's theory of general relativity, a theory of gravitation. Physics really began with Newton's theory of gravitation, by which he could explain the orbits of the earth and planets. His theory was so good that we can use it to predict eclipses to a hundredth of a second. In fact, Newton's theory was essentially perfect. As far as anybody knew, it explained everything.

Then why did Einstein produce another theory? Because he didn't like the looks of Newton's theory; it wasn't quite symmetrical. One had to put in several assumptions, and these could be removed. Hence Einstein developed a new theory called "general relativity." Of course, it had to predict everything Newton's theory did, because Newton's theory was right. But it also predicted three more things, things that were deviations from Newton's theory. They were so small nobody had ever found them. But physicists scurried to their telescopes to see whether they could find them and apparently have found all three. Einstein was right; his theory *was* better. And the basis of the theory was just that it was a beautiful theory. It was what scientists call "elegant."

My second example concerns the quantum theory. Professor Dirac wrote:

> I think there is a moral to this story, namely that it is more important to have beauty in one's equations than to have them fit experiment. It seems that if one is working from the point of view of getting beauty in one's equations and if one has really a sound insight, one is on a sure line of progress. If there is not complete agreement between one's work and experiment one should not allow oneself to be too discouraged because the discrepancy may well be due to minor features that are not properly taken into account, and they will get cleared up with further developments of the theory.

Professor Dirac says that if you have to choose between exact agreement with experimental data and the beauty of a theory, you choose the beauty of the theory. This is the way a scientist looks at nature. And this is how I responded to the Gospel. Here is a theory that is really beautiful; it explains so many things.

Yet what about the evidence? I really believed for the first time when I sat down and read through the Gospel of John one night. I was compelled to believe that this man Jesus was what he said he was. But then I got very concerned about being objective and began to look into the evidence for the reliability of the Bible. I was very pleased, just as Einstein was when they tested his theory, to find out that the Bible is indeed reliable. For example, there are literally hundreds of archaeological discoveries that make contact with Old Testament history, and we're told that not one discovery has conclusively disagreed with the Bible. This is remarkable, almost unbelievable. A lot of things are still unexplained, of course; we don't know, for example, just how the world was created by God. But a tremendous amount is verified.

We also find that the New Testament stories of Christ were written within the lifetime of the people who knew him, all within the first century. It would be like historians writing about the First World War between 1940 and 1980. Historically, then, the evidence is very good that what we have in the Bible now is accurate. It is as accurate as a historical record can be. In thinking back about my decision to believe, however, I realize that I really believed before I knew these things. And I think that Einstein also believed in his theory before the tests were made.

Another aspect of the Christian message that appeals to the scientist is that both the physical world and the Christian Gospel have certain peculiar characteristics. We find when we study the atom that we get down to a little particle called the "electron." I said "little particle," but it turns out that this "little particle" isn't always a particle. Sometimes it is like a wave. A particle is something that is right here, exactly, and a wave is something that is everywhere. Two things could not be more different from each other; yet both these descriptions fit electrons. The electron is sometimes a particle and sometimes a wave. It depends on how one looks at it. When it zips through a geiger counter and the geiger counter goes blip, there goes a particle through the counter. But sometimes the electron diffracts around things, and spreads all over, then it looks like a wave.

There is nothing mysterious about all this; it's just part of nature. But it is very complicated, and when we try to speak of something as small as the electron in terms of particles and waves that we see all around us, we find out that these limited concepts of ours just aren't adequate. Actually the electron is different from either a particle or a wave; but we must use human language and haven't lived inside an atom, and so are limited in our description of what happens.

The physicist isn't terribly surprised, then, when he runs into paradoxes in the Bible. For example, predestination and free will could not be more different from each other. In predestination, everything is determined, while with free will man can choose to do what he wishes. What really brings the problem to a head is that Paul writes about both. In fact, he writes about predestination in the ninth chapter of Romans and free will in the tenth. There they are, and unless Paul is a fool we have to recognize the force of both positions. To me, this is one of the best signs that Scripture is a revelation. A man writing from his own knowledge just would not clearly contradict himself; Paul obviously was writing down things he didn't completely understand. Certainly, no theologians since then have really understood these things.

This comparison between science and theology can be made even more precise. When we look at things from God's point of view, we find the sovereignty (supreme authority and control) of God and predestination. What he says is going to be done is done. When we get around to the other side and look from man's point of view, we see that we have free will. It's very much like the matter of the electron: what the object looks like depends on the experiment one does. Thus, there is something in the Christian Gospel that is very similar to what we find in nature, and as a scientist I find this reassuring. The Gospel may be very complicated and not readily understandable, but it shows signs of having the same Maker that nature has.

There is one point, however, at which I think the scientist is at a disadvantage in responding to the Christian message. One has to *believe* the Gospel. He can't just say, "Yes, that looks very nice. I'll write a book about it. I'll discuss some reasons why a scientist is attracted to the Christian Gospel." That is the natural response of a scientist: to set up his experiment on Christianity, get back, keep hands off, and see what happens. But he does not become a Christian by doing that. He has to take a step forward and say, "Yes, I believe it; I'm going to commit my life to it."

The Gospel does promise that if we believe, then we will begin to accumulate evidence. Let me quote Peter here. When everybody was turning away from Jesus, he said to his disciples, "Are you all going to leave me now?" Peter answered, "We have believed and have come to know that you are the Holy One of God." The disciples believed first, and then they were convinced. It's a bit like learning how to swim. One may be pretty sure he can do it, but in order to know he has to jump in. In responding to the Gospel one has to say, "All right, it's very convincing; I'm going to commit my life to this." Then, when he opens the Bible, he begins to understand things he didn't understand before. He can begin to pray in a different way. Events fall into place, and his assurance grows.

It is quite a few years now since I made this decision for myself, and I have never had reason to regret it. Since then I've learned more and more about the Gospel and therefore about myself, other people, and the purpose of life. The promises of God have been kept in my own experience; I've seen prayers answered, have had warm fellowship with other Christians, have experienced "the peace that passes understanding." What more could a scientist want than to have the most beautiful theory he can imagine validated so completely in the laboratory of life?

Week Eleven

Interpreting the Bible book of Genesis, chapters 1-3

Preview

The Bible book of Genesis is at the center of all God and science debates. Christians believe that the Bible is God's truth, God's word in human words. The New Testament quotes Genesis 1-3 as part of the basis for Christian beliefs. How do we interpret Genesis 1-3? Did God create the world in six 24-hour days?

God's Word is true - but our interpretations often fail

What the Bible TEACHES, and how we INTERPRET the Bible, are different things. We must always ask 3 questions: First, what does the Bible SAY? Second, what did the Bible MEAN (in its original cultural setting)? Then, finally, how do we APPLY the Bible to our circumstances today? We must not adjust the Bible to science or science to the Bible.

In the late 4th - early 5th centuries, the North African Christian thinker Augustine warned Christians to not be totally sure about their interpretations of the Genesis creation account. *Even non-Christians know things about the natural world, the elements, and the orbits of stars. They know these things from reason and experience. If they then hear a Christian talking foolishly about these things - and making unproven claims based on the Bible - how will the non-Christian believe what Bible teaches about the resurrection of the dead, the hope of eternal life, and the kingdom of heaven?* [30]

Four interpretations of the Genesis "days"

All Christian ministers in the Presbyterian Church in America must state their belief that "... the Scriptures of the Old and New Testaments, as originally given, (are) the inerrant Word of God, the only infallible rule of faith and practice." In 2000, a church Creation Study Committee noted "differences in interpretation ... which we need to continue to explore patiently and respectfully before God." Centuries earlier, Augustine said: "different interpretations are sometimes possible without prejudice to the faith we have received ... we should not... so firmly take our stand on one side that, if further progress in the search of truth justly undermines this position, we too fall with it." [31]

Four interpretations are compatible with belief in Genesis and God's true, historic creation:

1. Calendar Day Interpretation. This interprets the Genesis "days" as 24-hour days - in an obvious, ordinary, literal sense. But Genesis says that the sun and the moon were not created until Day 4. So, how can Days 1-3 be "solar days?" And did God intend to mislead us by what "appears to be" an old earth that has long geological ages?
2. Day-Age Interpretation. This interprets Genesis "creation days" as extended periods of time of no specified length, days that possibly overlap. The Bible sometimes uses the term "day" in a non-literal sense. This interpretation allows for long geological ages. Some Christians interpreted Genesis this way before Darwin and modern geology.
3. Framework Interpretation. The "creation days" are topical, not chronological. God's "week" is a literary metaphor to describe God's acts of creation. The exact timing is not specified. The days are in 2 groups. Days 1-3 God "forms." Days 4-6, God "fills." On Day 1, God creates light. On Day 4, God creates the sun and moon. When Moses wrote Genesis, many people worshiped the sun and the moon. But the sun and moon are also God's creations, to spread God's creation of light. So they are not gods!

Notes:

inerrant = free from error, without defects

infallible = always true, will not fail you or be unfaithful to you.

topical = set in order or arranged according to topics or themes.

chronological = set in order or arranged by date, the order of time.

metaphor = a word picture that is true, but not literal. A metaphor is an implied analogy. When Jesus said, "You are the salt of the earth" - that is a metaphor. If he had said, "You are LIKE the salt of the earth," that would be an analogy.

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[30] This is a paraphrase, in simplified English, from Augustine, *The Literal Meaning of Genesis*, Book 1, chapter 19

[31] ibid, *Book 1, chapter 18.*

Interpreting the Bible book of Genesis, chapters 1-3

Notes:

analogy = In some ways, similar. But not alike in other ways. God's work week is "like" our work week - but it is not an exact equivalent.

When you take a closer look at Genesis 1-3, you discover *artistic* and *literary* word structures designed to offer us God's meaning and not necessarily the methods in creation.

God's creation began in a state of total disorder. The "days" of creation seem to be in pairs: God "forms" and "fills."

On days 1-3, God solves the problem of the "formlessness." On days 4-6, God solves the "emptiness" in creation:

FORMS:	FILLS:
DAY 1 light and darkness	DAY 4 sun and moon
DAY 2 skies and sea	DAY 5 birds and fish
DAY 3 dry land and vegetation	DAY 6 humans and food

4. Analogical Day Interpretation. The Genesis "creation days" are God's work days. God's days are an analogy - not identical - to our work days. God sets the pattern for our life rhythm of rest and work. God prepares, then populates (forms and fills) the earth as the place where we can live, work, love, and worship. The length of the days is not specified. Most important is the pattern: 6 days work + 1 day rest.

We will probably never improve on Augustine's humble wisdom: "What kind of days these were it is extremely difficult, or perhaps impossible for us to conceive..."[32]

A Closer Look at the Bible

When we stop trying to "force fit" the Bible and modern science, we find that Genesis 1-3 has some very significant and life-changing insights for us:

1. Genesis 1:1-4: *In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters. And God said, "Let there be light," and there was light. God saw that the light was good, and he separated the light from the darkness.* ▸ God is the Giver of all life and light. God's Word and Spirit bring order out of confusion and life out of chaos. God's Word distinguishes light and darkness.
2. Genesis 1:26-27 *God said, "Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all the earth, and over all the creatures that move along the ground."* ▸ God created man in his own image, in the image of God he created him; male and female he created them. We are not gods or animals. Men and women have equal dignity, distinct from other creatures. Human life has special value. We are God's vice-rulers and care-takers of God's creation.
3. Genesis 2:1-3 *By the seventh day God had finished the work he had been doing; so on the seventh day he rested from all his work. And God blessed the seventh day and made it holy, because on it he rested from all the work of creating that he had done.* ▸ God's pattern is 6 days work, then 1 day of rest. Work and rest, reflection and evaluation, is also our pattern for life. We are not "defined" by work, but by worship. We reflect God's image and work in our lives.
4. Genesis 2:7 *The LORD God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.* ▸ God is the Source of life, and new life, by the "breath" of God's Spirit.
5. Genesis 2:18, 24 *The LORD God said, "It is not good for the man to be alone. I will make a helper suitable for him ... For this reason a man will leave his father and mother and be united to his wife, and they will become one flesh."* ▸ Marriage is not a relationship based on power or property. God defines the family and creates a one-flesh union between two image-bearers. The husband and wife are distinct individuals. But they are also complementary partners.
6. Genesis 3:15 *"I will put enmity between you and the woman, and between your offspring and hers; he will crush your head, and you will strike his heel."* ▸ This is the first promise in the Bible of the coming of Jesus Christ to save the world through death on the cross. God will restore all things as a "new creation" through a man who will be born to a woman. The Promised One will be attacked and harmed by evil. But, then, he will forever crush evil and the author of evil.

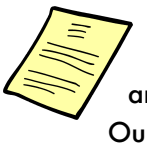
[32] Augustine, *The City of God, Bk. XI, chap. 6*

Week Twelve

Confirming your discoveries - in community

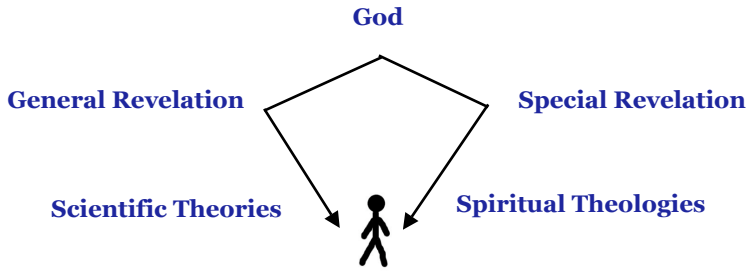
Preview

Hopefully, you now realize that God and science are not enemies, but friends. Science does not replace religion. And religion does not replace science. They are two paths to truth. Science seeks to explain *physical processes* - the HOW? Faith seeks spiritual and personal knowledge about *life's purpose* - the WHY? of our lives. Scientific and spiritual knowledge come from two different sources – nature and the Bible. God is the Author of both, so both reveal God. Our scientific and spiritual discoveries are confirmed when shared in communities of science and faith.



The "two books"

Christianity teaches that God is the Creator or Maker of all things - both visible and invisible. Scientific theories are based on your studying the physical world. Our spiritual theologies are based on studying the Bible. These have been called the "books" of nature and the Bible. God is the Author of both. So, nature and the Bible reveal wonders from God. These "2 books" are sometimes called "general revelation" and "special revelation." Nature displays God's wonders in nature to everyone (in "general"). And the Bible reveals "special" spiritual knowledge to faith - to the "eyes of the heart." This can be diagrammed like this: [33]



The wonder of discovery

The student of nature (the scientist) and the student of the Bible both experience the wonder of discovery. There are limits to both science and faith. The Bible reveals spiritual things that science cannot study. In spiritual discovery we "fix our eyes not on what is seen, but on what is unseen."[34] Scientific discovery reveals natural processes not described in the Bible. The Bible claims to be God's truth, but does not claim to be a textbook of modern science.

Our interpretations about the physical world are scientific theories. And our interpretations of the Bible are spiritual theologies. Because we are fallible humans, both our theories and our theologies are far from perfect. For a scientific example: Newtonian physics explained observable motion and gravitation. Later, the theory of relativity replaced it.

But the search for spiritual and scientific discoveries are very parallel. A scientist observes and experiments with data from the natural world. Next comes the testing of hypotheses. Finally, a scientist arrives at a framework for understanding: a scientific theory.

In a similar way, the Christian will examine the "data" of the Bible. Next the believer should interpret the parts of the Bible in the context of the whole Bible. Finally, a Christian will come to a framework for understanding: a theology about God and spiritual reality.

Notes:

theory - a testable way to explain HOW things work. Like the theory of gravitation, or theory of relativity: $E=MC^2$.

theology - a summary of the nature of God and spiritual reality.

fallible - we can fail. We are sometimes wrong, and can make errors in judgment and behavior.

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[33] From the report of the Creation Study Committee report of the Presbyterian Church in America

[34] 2 Corinthians 4:18, New International Version of the Bible

Confirming your discoveries - in community

Notes:

confirm - to verify, make sure, support and make firm, strengthen, and validate the truth.

Amen - when a Christian or church says "Amen," it is a response to God's truth that says "Yes! What I have heard is true, not just true in my own experience, but also true for us all."

The "two communities"

There are two "books" for research and discovery (the physical world and the Bible). And there are two "communities" that have an important place in our search for both scientific and spiritual knowledge. Any scientist who is a Christian will belong to both.

In modern science, discoveries made through personal investigation must be tested and verified by other researchers. The wider "scientific community" will correct findings and include previous knowledge. Theories based on a wide consensus are the ones that are considered objective and true. Your findings are made available for others to confirm.

This same process is also true in spiritual discovery. In your personal Bible reading, God will speak to your mind and heart. Your own personal Bible reading is important. The scientist explores the structures of the universe. And the Bible student considers the mind of Christ and the loving purposes of God's love.

But spiritual discoveries must be confirmed in a community of faith - the local church. When they share and discuss their personal Bible discoveries, Christians grow in their faith in Christ, their love for God and for each other. In fact, the Bible word "Amen" has this meaning - that other people agree that your discovery is true. The scientist confirms his findings by a process of publication to others. A Christian's faith is not only personal and private - but shared and made strong in a community.

How do these Bible passages describe the importance of a community of faith?

"We know that an idol is nothing at all in the world and that there is no God but one. For even if there are so-called gods, whether in heaven or on earth (as indeed there are many "gods" and many "lords"), yet for us there is but one God, the Father, from whom all things came and for whom we live; and there is but one Lord, Jesus Christ, through whom all things came and through whom we live. But not everyone knows this." (1 Corinthians 8:4-7)

For no matter how many promises God has made, they are "Yes" in Christ. And so through him the "Amen" is spoken by us to the glory of God. Now it is God who makes both us and you stand firm in Christ. He anointed us, set his seal of ownership on us, and put his Spirit in our hearts as a deposit, guaranteeing what is to come. (2 Corinthians 1:20-22)

Speaking the truth in love, we will in all things grow up into him who is the Head, that is, Christ. From him the whole body, joined and held together by every supporting ligament, grows and builds itself up in love, as each part does its work. (Ephesians 4:15-16)

A Challenge for You!

Albert Einstein was a brilliant scientist. Though he was from a Jewish heritage, he never became a believer in Christ. But Einstein was not against religion. He said, "I do not think that it is necessarily the case that science and religion are natural opposites. In fact, I think that there is a very close connection between the two. Further, I think that science without religion is lame and, conversely, that religion without science is blind. Both are important and should work hand-in-hand." [35]

[35] Peter A. Bucky, et. al., The Private Albert Einstein (Kansas City, 1992), p. 85.

Introduction to Dr. John Walton

John H. Walton (Ph.D., Hebrew Union College) is professor of Old Testament at Wheaton College. Previously he was professor of Old Testament at Moody Bible Institute in Chicago, Illinois. Some of his books include Ancient Near Eastern Thought Essential Bible Companion), Old Testament Today (with Andrew Hill), Genesis NIV Application Commentary and IVP Bible Background Commentary (with Victor Matthews and Mark Chavalas).

Since this course was written (2006), Dr. John Walton has published these books, helpful for discussing origins.

Dr. John Walton is the author of *The Lost World Series.* These books bring a fresh and close reading of the Hebrew text and knowledge of Ancient Near Eastern (ANE) literature. Available from Amazon.

1. *The Lost World of Genesis 1: Ancient Cosmology and the Origins Debate*
2. *The Lost World of Adam and Eve: Genesis 2-3 and the Origins Debate*
3. *The Lost World of the Flood: Mythology, Theology, and the Deluge Debate*
4. *The Lost World of Scripture: Ancient Literary Culture and Biblical Authority*
5. *The Lost World of the Prophets: Old Testament Prophecy and Apocalyptic Literature in Ancient Context*
6. *The Lost World of the Israelite Conquest: Covenant, Retribution, and the Fate of the Canaanites*
7. *New Explorations in the Lost World of Genesis: Advances in the Origins Debate*

The first two books are helpful for discussions about God and Science. John Walton believes in a historical Adam and Eve, as *archetypes* (not *prototypes*) of all humans. As a scholar of ANE literature, Walton reminds us that Scripture was given by God, *for us but not to us.* In the cultural context of ANE culture and literature, he does not think of Genesis as a *house story* (physical or biological origins of the cosmos) but as a *home story* (God's creating sacred space to dwell with us).

You can find many video presentations by Dr. John Walton on YouTube. Here are three, **excellent full presentations**:

1. *Origins Today: Genesis Through Ancient Eyes,* **Part 1: Cosmic Origins**. Anselm House. YouTube Link here.
2. *Origins Today: Genesis Through Ancient Eyes,* **Part 2: Human Origins** + Questions and Answers. Anselm House. YouTube Link here.
3. *Understanding Genesis.* A conversation with a pastor, Dr. Chip Bennett. YouTube link here.

Briefer but excellent videos that focus on Adam and Eve:

1. *Understanding Genesis* - Insights from the study of Near-East Cultures. The Faraday Institute. YouTube Link here.
2. *Understanding Adam and Eve and the Fall.* The Faraday Institute. YouTube Link here.