

**Physics
and
Faith 5.**

**A Universe of True
Becoming**

Introduction

In the last 3 sessions, we have considered unexplained contingencies or boundaries in modern physics that can be considered as "rumors of God."

In the next 2 sessions, we will consider ways in which modern physics might influence theological doctrines on:

- Divine Action
- The Fall and Original Sin
- The Last Things (Eschatology)

Questions about Divine Action and Human Freedom

Divine Action:

How does God act in the world? Is the network of causality in the laws of physics so "tight," so "rigid," that there is no "room" for God to act?

- *reciprocal question*: How much "freedom" do we and the rest of creation have to act and "change the world?" Is the network of causality in the laws of physics so "tight," so "rigid" that most of what happens is predetermined?

Questions about Divine Action and Human Freedom

The answers to these questions have far-reaching implications:

- if there is *little or no room* for God to act, then perhaps God is a "clockmaker" God who set the world in motion and is now sitting back watching it tick (or off doing other things)
- if there is *little or no room* for *us* to act, then perhaps our sense of "freedom" to choose is mostly an illusion, and human lives and history mostly predetermined

Questions about Divine Action and Human Freedom

If there is a lot of "room" or play in the laws of physics for God or us to act:

- how much of that "room" does God use?
- how much of that "room" does creation get to use? (How much freedom do we and the processes of creation have to change and "make" the universe? How much of the unfolding of creation is caused by us?)

Questions about Divine Action and Human Freedom

If there is a lot of "room" in the laws of physics for God or us to act (continued):

- if God yields *little or none* of that "room," then would not God be responsible for most of what happens in the universe, including evil?
- if God yields *all* of that "room" to creation, then don't we end up with a withdrawn, uninvolved God?

Questions about Divine Action and Human Freedom

If there is a lot of "room" in the laws of physics for God or us to act (continued):

- if God *yields some* of that "room," allowing creation to "make" itself, but also *retains some* of that "room" for Godself so God can interact with the creation as it "makes" itself, would God also have to give up knowledge of the future?

Questions about Divine Action and Human Freedom

Key notion here: **causality**

- 1. how much of what happens is "caused" (determined) by the laws of physics (which come from God)
- 2. how much of what happens is "caused" by us exercising our human freedom, and by the "free" processes of creation?
- 3. how much of what happens is "caused" by God interacting daily with God's creation?

Theology: Providence

General Providence

- the divine "sustaining" of the world by God
- includes the "laws of physics" and any other "laws of natures" gifts of a faithful God

Special Providence

- God acting in history within the "boundaries" of the laws of physics
- actions are "hidden:" may be discernable by faith, but cannot proven to the skeptic

Miracles

- God contravening the laws of nature ("water into wine")

Theology: Divine Action

Theories of Divine Action:

1. Single Action
2. Primary Causality
3. Process Thought
4. Analogies with Human Action:
 - Embodiment
 - Top-Down Causality

Theology: Divine Action

Single Action

- God's relationship to creation is a single timeless act of sustaining creation
- that is: there is only **General Providence**.
God's only action is the one act of the gift of the laws of physics
- the view of the Deist in the 18th century (universe ran with the precision of Newton's laws like a clock. God was a clockmaker)
- *problems:*
 - No **Special Providence**. God uninvolved with the world. Can such a God be a "personal" God?

Theology: Divine Action

Primary Causality

- a theological tradition going back to Thomas Aquinas
- God acts as the "primary cause" behind "secondary causes" (ourselves and nature)
 - God is the "unmoved" mover, the "prime mover" without whom nothing would happen
- analogy: music of a pianist dependent on the skill of the pianist (primary cause) and the piano (secondary cause)
- *problems:*
 - "causal link" primary-secondary fuzzy and unintelligible in most applications

Theology: Divine Action

Process Thought

- God acts through persuasion
- fundamental reality is a "event" or "actual occasion." Each "event" is bipolar, with:
 - a "**prehensive phase**:" event influenced by all past events and the "lure" of God's persuasion
 - a "**concretive phase**:" event takes on one possible outcome
- God is a "fellow sufferer who understands"
- *problems*:
 - a God who can only persuade cannot guarantee triumph of good over evil

Theology: Divine Action

Analogies with Human Action:

Embodiment

- God is the "mind" or "soul" of the world
- God acts in the same way our own minds control the body
- compatible with **pantheism** (nature is God) or **panentheism** (God contains the world but also transcends it)
- *problems:*
 - our own "mind-body" problem is unsolved
 - universe does not look like an organism
 - universe had a beginning and will die: not compatible with it being part of God

Theology: Divine Action

Analogies with Human Action: Top-Down Causality

- there is an influence of the "whole" upon the "parts," (top-down causality) as well as the "parts" on the "whole" (bottom-up causality)
- analogy: a person raising their arm is both:
 - action of a whole individual ("whole" acting on the "parts")
 - action of neurons, nerves ("parts" acting on the "whole")
- perhaps God acts through the "whole" universe (Arthur Peacocke: God "the boundary condition of the universe"), effecting the parts

Modern Physics

How might modern physics weigh in on the questions and speculations about:

- how does God act in the universe? (What is God's relationship to the day to day operations of God's creation?)
- how much "freedom" do we and the processes of nature have to "make" the creation?

Modern Physics

End of Newtonian Determinism

Universe is not a clock. "**Newtonian Determinism**" is dead.

-18th and 19th century physics was dominated by **Newtonian Determinism**, which purported:

- given all the input parameters, the laws of physics can precisely predict the behavior of any phenomenon to any required degree of accuracy
- if we know all the initial or starting conditions of the universe, and had a sufficiently powerful computer, we could precisely predict the universe's entire future

Modern Physics

End of Newtonian Determinism

Newtonian Determinism is now dead because of:

1. Quantum physics

- ultimate physical reality must be imagined as a "ground of being" teeming with latent potentialities, latent possibilities not yet actualized, not yet "real" (encoded by the "wavefunction")
- the act of measurement seems to cause *one* of these potentialities to become actualized. Out of the range of possibilities, one possibility becomes "real", and a "particle" (or "quantum") temporarily appears (the "wavefunction collapses")
- this "collapse of the wavefunction" is unpredictable, seemingly random

Modern Physics

End of Newtonian Determinism

Newtonian Determinism is now dead because of:

2. “Chaos” Theory = Extreme Sensitivity to Initial Conditions = “The Butterfly Effect.”

- many if not most complex systems of nature are extremely sensitive to the starting conditions
- a minute, nearly infinitesimal difference in the starting conditions can lead to completely different behaviors. Two different ways a butterfly flaps its wings in France can lead to two different weather patterns in Minnesota one month later

Modern Physics

Quantum Physics and Chaos Theory

Quantum Physics and Chaos Theory:

- Tell us the universe is not a "predictable" system. The future physically *cannot* be determined.
- Provide an "opening" for:
 - **Special Providence.** God's unseen acting in the day to day processes of the creation
 - The "freedom" of Creation to "make" itself

Modern Physics

Quantum Physics and Chaos Theory

God's day to day action within Creation

(**Special Providence**) might involve:

- "*Bottom-up Causality*:" God could influence the collapse of the wavefunction
- "*Top-down*" *Causality*:" God could influence of the behavior of complex systems with infinitesimal tweaking of starting conditions (perhaps through the persuasion of a butterfly, or a human being)

Modern Physics

Quantum Physics and Chaos Theory

Invites us to consider the universe as both
rational and **free**, “Wholly Other”

Two gifts given by God to the universe:

- 1. *Rationality, Order, Regularity, Reliability* (the Laws of Physics) sign of God’s faithfulness
- 2. *Independence and Freedom*; a universe “wholly other:” sign of God’s love
 - expressed in the built-in chance, happenstance given to nature, that allows the universe to evolve and give rise to novelty and new forms -- to become “creative”

Modern Physics

Quantum Physics and Chaos Theory

"The statistical character of atomic events and the instability of many physical systems to minute fluctuations, ensures that the future remains open and undetermined by the present. This makes possible the emergence of new forms and systems, so that the universe is endowed with a sort of freedom to explore genuine novelty."

- physicist Paul Davies

Modern Physics

Quantum Physics and Chaos Theory

"In the 20th century, we have learned that whatever the physical world is, it is not a machine. It is not the world of clockwork regularity that it seemed to the people of the 18th and (to a large extent) the 19th century. The processes of the world is something more subtle and more supple than that.... the world is world of true becoming, a world where the future is genuinely new."

- John Polkinghorne

Questions for Discussion

1. If God has given the universe **rationality** and **freedom** to make itself, how might that explain the presence of *evil* in the world?
2. If God has given the universe the freedom to make itself and if God has chosen to interact daily and lovingly with creation, can *God know the future*?
3. If the rationality of the universe is a gift of God, a sign of God's faithfulness, and if God has the self-consistency of a person, what might that tell us about *miracles* (acts contravening the laws of physics)

References

- Science and Religion: An Introduction.** Alister E. McGrath, Blackwell Publishers, Oxford, 1999.
Chapter 4 (Science and the Philosophy of Religion)
- Science and Theology: An Introduction.** John Polkinghorne, SPCK / Fortress Press, London / Minneapolis, 1998. *Chapters 3 (Humanity), and 5 (Divine Action)*
- Quantum Cosmology and the Laws of Nature. Scientific Perspectives on Divine Action. Second Edition.** Robert John Russell, Nancey Murphy, and C. J. Isham, editors. Vatican Observatory Publications and the Center for Theology and the Natural Sciences, Berkeley, 1996. Distributed by University of Notre Dame Press. *Chapter "The Laws of Nature and the Laws of Physics," by John Polkinghorne, page 429*