

Physics and Faith 1. The Relationship Between Science and Theology

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Primary Reference

1. Introduction

Ian Barbour classifies views on the relationship between science and theology into four groupings:

- 1. Conflict
- 2. Independence
- 3. Dialogue
- 4. Integration

2. Science and Theology Are Conflicting View of Reality

2.1. Introduction

One view of the relationship between science and theology is that they are two **conflicting views of reality**.

On the science side of this point of view is **Scientific Materialism**; on the religious view is **Biblical Literalism**.

2.2. Scientific Materialism

2.2.1. Tenets of Scientific Materialism

The tenets of Scientific Materialism:

- 1. the scientific method is the only reliable path to knowledge (= **scientism**)
- 2. *matter* is the fundamental reality in the universe

Tenet 1: is a *epistemological* (= the nature of knowledge) assumption

Tenet 2: is a *metaphysical* (= the nature of reality) assumption

Acceptance of both these two assumptions imply only those things studied by science are real.

2.2.2. Reductionism in Scientific Materialism

Scientific Materialism often involves **reductionism**:

- 1. **Epistemological Reductionism** -- All scientific theories ultimately reducible to the laws of physics

"All science is either physics or stamp-collecting"

A statement attributed to Ernest Rutherford, discoverer of x-rays (not necessarily in the context of a discussion of epistemological reductionism, but it cogently expresses the attitude that might lead there)

- 2. **Metaphysical Reductionism** -- the component parts of a system are the fundamental reality. There is nothing significantly or profoundly "new" in higher orders of organization.

2.2.3. Science versus Religion From the Point of View of Scientific Materialism

Science (Scientific Method):

- 1. uses only reproducible, public data
- 2. theories are subject to experimental testing / observations
- 3. defined criteria for evaluation of competing theories

Religion:

- 1. no reproducible, public data
- 2. no experimental testing
- 3. no accepted criteria for evaluation of competing theories

Religion is therefore subjective, parochial, uncritical.

2.2.4. Philosophical Movements Arising from Scientific Materialism

2.2.4.1. Philosophical Materialism

Scientific Materialism leads to **Philosophical Materialism**

- matter alone is real
- the mind, purpose, human love are byproducts of matter in motion

Jacques Monod's *Chance and Necessity* eloquently expresses this point of view:

- "Man knows at last that he is alone in the universe's unfeeling immensity, out of which he emerged only by chance"
- "Anything can be reduced to simple, obvious mechanical interactions. The cell is a machine. The animal is a machine. Man is a machine."
- Consciousness an illusion that will be explained biochemically

2.2.4.2. Logical Positivism

Logical Positivism was a philosophic movements in 1920's to 1940's that said that:

- Scientific discourse is the norm for meaningful language
- The only meaningful statements we can make are those verifiable by sense data
- Statements in ethics, metaphysics, religion are:
 - meaningless pseudo-statements
 - expressions of emotion / preference without cognitive significance

2.3. Biblical Literalism

Most mainstream Christian denominations consider scripture a **human witness** to God's revelation (and hence fallible)

1970's and 1980's saw a rise in **fundamentalism**. Fundamentalists consider the scripture the **inerrant, literal word of God**. The Bible thus interpreted provided:

- certainty in a time of rapid change
- basis for defense of traditional values in time of moral disintegration (sexual permissiveness, drugs, crime. . .)

Modern science however clearly conflicts with a literal reading of the Bible.

This has led for example to the "opposition" movement of **Creation Science** or **Scientific Creationism**, which claims there is scientific evidence for the creation of the world in the last few thousand years.

3. Science and Theology Are Independent Views of Reality

3.1. Introduction

A common and widespread point of view is that science and theology are **two totally independent, autonomous activities**.

The basis of this point of view is that science and theology are:

- Completely different realms or spheres of human life:

- **Neo-Orthodoxy**

- **Religious Existentialism**

- or, Completely different "languages:"

- **Linguistic Analysis Movement**

3.2. Neo-Orthodoxy

Neo-Orthodoxy was a post World War I reaction to Protestant Liberalism, which had posited an optimistic belief that human society was progressing to a better world through the progressive enlightenment of the humanity, a view that was shattered by the horrors and atrocities of the great World War.

Karl Barth was Neo-Orthodoxy's most prominent theologian. Barth emphasized that God is transcendent, unknowable except as self-revealed through Jesus Christ. Theology and science were completely independent of each other, because:

- Theology is based on divine revelation

- whereas science is based on human observation and reason

- Religious faith is based entirely on God's initiative, not on any kind of human discovery

- whereas Science is based on solely on human discovery.

- God acts in history,

- not in nature

3.3. Religious Existentialism

3.3.1. *I-It Versus I-You Relations*

3.3.1.1. I and Thou

In 1923, Martin Buber published *I and Thou* (the usual English translations of the German *Ich und Du*)

Two modes of experiencing / relating to the world:

- 1. Experience of an object = "**I-it**" Relation

- 2. An Encounter with Another = "**I-Thou**" or "**I-You**" Relation ("You" is the "You" of intimacy, which used to exist in English in the word "Thou")

3.3.1.2. I-It Relationships

"**I-it**" Relation:

- We objectify, conceptualize, fit into the "box of our understanding" that which we see, hear, etc ("it").

- Impersonal

- The "normal" experienced world of space and time

3.3.1.3. I-You Relationships

“I-You” Relation:

- The “You” can never be objectified, or “boxed” into our understanding. A “You” has no borders, cannot be measured. A “You” “fills the sky” of our mind's eye
- An encounter, a transitory event (the “event of relation”) which is mutual and reciprocal
- Can be called love
- Comes to us by grace

A “person” then is someone with whom we can have an “I-You” relationship. The person of an “I-You” encounter cannot be “objectified,” or “boxed-in,” turned in “content.” A person of an “I-You” encounter is a *Presence*, is *Presence* as power.

3.3.2. Science Versus Theology: I-It Versus I-You Relationships

The view of **Religious Existentialism** is that God is a being encountered in an “I-You” relationship, whereas Science deals only with “I-It” relationships. They are thus two independent modes of seeing the world.

3.4. Linguistic Analysis

3.4.1. The “Language Game”

Linguistic Analysis was a philosophical school that came after **Logical Positivism**.

It taught that different human endeavors use different types of “language” that serve different functions.

You cannot “translate” from a language serving one function to a language serving another function Wittgenstein, called this the “language game”

3.4.2. The Language of Science Versus the Language of Religion

The language of **Science** functions for prediction and control.

The language of **Religion**, one the other hand, functions to:

- recommend a way of life
- form attitudes
- encourage moral principles

Each language is valid only for the function it is designed for.

Note that Linguistic Analysis is a form of **Instrumentalism**: scientific theories and religious beliefs are merely **human constructs** for specific **human purposes**

4. Science and Theology are Views of Reality in Which Dialogue Is Possible

The suggestion that science and theology are views of reality in which some kind of “dialogue” encompasses a potpourri of conceptions about science and theology. The suggestion is that there are some *indirect* or *peripheral* points of contact between theology and science.

Some examples of “Dialogue” between science and theology include:

- Limit Questions. Science often leads us to a “limit,” to questions science alone cannot answer. For example: the ethical questions that come up in medicine.
- Nature-Centered Spirituality. We can respond to nature in personal and experiential ways that can

have spiritual significance for the individual. The beauty of a sunset, the night sky, or the knowledge of the grandeur and scope of the universe as revealed to us in modern astronomy, can all evoke deeply spiritual feelings.

5. Science and Theology are Integral Views of Reality

5.1. Introduction

A final point of view about the relationship between science and theology (and the point of view that these presentations will presume) is that an **integration** is possible -- at times necessary -- between theology and science. Barbour suggests that we can find three versions of this integration:

- 1. **Natural Theology.** We can prove the *existence of God* through *study of nature*, or at least find *rumors* of the existence of God in nature. That is, some truths about God can be worked out by the human intellect alone.
- 2. **Theology of Nature.** Theology is largely outside the realm of science, but where they *overlap*, they must be *consistent*. (The Theology of Nature is a confusing name, since grammatically it would appear to be the same as Natural Theology. Nonetheless, it is typically used to define a weaker version of integration than Natural Theology).
- 3. **Systematic Synthesis.** The views of reality offered by science and theology can be *combined* to give a comprehensive view of reality

5.2. Natural Theology

5.2.1. Introduction

In **Natural Theology**, science is the starting point for the search for God. Natural Theology says that by studying nature:

- we can find proof of God existence or least find rumors of the existence of God
- we can learn something about the nature of God through nature

“Ever since the creation of the world, his [God's] eternal power and divine nature, invisible though they are, have been understood and seen through the things he has made”

-- St. Paul, in Romans 1:20

5.2.2. Arguments for the Existence of God in Natural Theology

Arguments for the Existence of God in **Natural Theology** can generally grouped into one of the following:

1. The **cosmological argument**. There must be a "first" cause (God)
2. The **teleological argument**. There must be an ultimate designer (God)

5.2.3. The Cosmological Argument or "First Cause" Argument

Cosmological Argument or **"First Cause" Argument** (Thomas Aquinas, 1225-1273):

- 1. Everything in the universe depends on something else for its existence
- 2. What is true of the parts of the universe must also true of the universe itself
- 3. Therefore, the universe must also depend on something else for its existence
- 4. That "something else" is, by definition, that which we call God

5.2.4. The Teleological Argument or "Argument from Design"

Teleological Argument = Argument from Design

- *telos* = Greek for the "end" or "purpose"
- things do not simply exist, they appear to have been **designed** for a **purpose**

Thomas Aquinas on the Teleological Argument:

The fifth way is based on the governance of things. We see how some things, like natural bodies, work of an end even though they have no knowledge. The fact that they nearly always operate in the same way, and so as to achieve the maximum good, makes this obvious, and shows that they attain their end by design, not by chance. Now things which have no knowledge tend towards an end only through the agency of something which knows and also understands, as in the case of arrow which requires an archer. There is therefore an intelligent being by whom all natural things are directed to their end. This we call "God"

5.2.5. Contingences and Dependencies in Modern Physics

5.2.5.1. Introduction

The **Cosmological** or "**First Cause**" Argument, and the **Teleological Argument** or **Argument from Design** have in common the idea that some aspect or property of the universe is *contingent* or *dependent* on something else -- God.

Several unexplained "contingencies" in modern physics have been suggested as "rumors" of a designer, creator and/or sustainer:

- (1) the laws of physics
- (2) the boundary implied by a beginning (a time = 0) to the universe
- (3) the existence of space-time itself
- (4) the Anthropic Principle
- (5) the "Ground of Physical Reality" of Quantum Physics

(We will be discussing (1) and (2) in session 2 of this series; (3) and (4) in session 3, and (5) in session 4. What follows is a preview:)

5.2.5.2. The Laws of Physics

(1.) The Laws of Physics

- The universe has been found to obey laws of great mathematical beauty and elegance
- Where do these laws come from?
- Why do these laws appeal to our sense of beauty?
- Why are these laws comprehensible to us?

5.2.5.3. The Boundary Implied by a Beginning of the Universe

(2.) The Boundary Implied by a Beginning of the Universe

Near the beginning of time, a "Big Bang" -- a great fireball of immense density and temperature -- filled all of space and started its evolution

The theories of Relativity tell us space and time are woven together in a single created fabric called **space-time**

Models of the Universe using General Relativity lead to a point where time = 0 where the fabric of space-time was undefined, immediately after which both space and time abruptly began to exist

- What "caused" the universe to emerge at $t = 0$?

5.2.5.4. The Contingency of Every Point of Space-Time

(3.) The Contingency of Every Point of Space-Time

Modern physics has not yet succeeded in findings a satisfactory theory that unites the **General Theory of Relativity** (Einstein's theory of gravity) with **Quantum Physics**. There is presently no complete theory of gravity that takes into account quantum physics (The name proposed for such theories is **Quantum Gravity**).

Some early work in **Quantum Gravity** suggests that the dimension we call time becomes "fuzzy" and turns into a fourth spatial dimension as we approach "time = 0." There is thus no "beginning" to the universe -- time becomes meaningless as we "approach" "time = 0".

Whether this ultimately turns out to be true or not, it reminds us that:

- The created universe is a "block" of space-time
- All points of the "block" of "space-time" require an explanation
 - giving special significance only to the point where time = 0, (which may in fact not exist in the created block of "space-time") is specious
 - The theological concepts of *creatio ex nihilo* (creation from nothing) and *creatio conservata* (God's continued sustaining of the physical universe) are the same

5.2.5.5. The Anthropic Principle

(4.) The Anthropic Principle

- We live in a universe that appears to be incredibly fine-tuned to produce life
- The slightest deviations in the physical constants or the laws of physics would have resulted in a sterile universe devoid of stars and life

Is this evidence for a Designer?

5.2.5.6. The Ground of Physical Reality of Quantum Physics

A possible fifth contingency is:

(5.) the "Ground of Being" from Quantum Physics*:

Quantum physics challenges our conceptions of the fundamental nature of physical reality. It tells us:

- The atomic "particles" of which we are made are not the ultimate physical reality.
- There is a deeper, ultimately "impenetrable" ground of physical reality which must be imagined as teeming with latent potentialities, latent possibilities not yet actualized, not yet real (these potentialities are described by the "wavefunction" or "state function")
- The act of measurement or observation causes one of these possibilities to become actualized, to become real; a particle will "appear" for a short period of time as a result of the measurement (called the "collapse of the wavefunction")
- After the measurement is completed the "particle" will fade back into the impenetrable realm of latent potentiality and possibility
- Whenever two or more "particles" interact, the ground of physical reality never seems to "forget" what they shared
 - In a deeper sense, the interacting "particles" become a single entity with shared latent potentialities and possibilities, and this sharing, the "strength" of this single entity, is never diminished by separation in space and time (quantum entanglement = quantum nonlocality; the EPR paradox)

This leads to the metaphysical questions:

- What is the "realm" in which the "wavefunctions" = latent potentialities "exist"? What is the nature of their "being"?
- How does this "ground of physical reality" "remember" all the interactions between "particles" and what they shared? Why is this remembrance unaffected, impervious to separations in time and

space?

5.3. Theology of Nature

5.3.1. Introduction

Theology of Nature holds that:

- Theologians and scientists are both involved in the "ultimate concern" of finding truth
- Both are independent sources of truth, but in some areas they overlap
 - "What anybody has said about the truth belongs to us, the Christians" -- Justin Martyr
- Religious beliefs and doctrines must be in harmony with scientific truths
 - Some traditional theological doctrine may need to be modified based on what we learn about nature through science
- No need to use different languages when talking about the same thing (The answer to Linguistic Analysis)

Examples of two areas of theology where physics might change "doctrine:"

- 1. How does God work in the universe? Why is there "evil" in the world?
- 2. Eschatology (Theology of the Last Things)

(*We will be discussing these issues further in sessions 5 and 6 of this series)

5.3.2. How Does God Work in Creation?

How does God work in the universe?

Modern physics tells us Newtonian "determinism" is dead. The universe is not the "clock" of the Deists and God is not a "clockmaker" god. The universe instead appears to have an element of chance and happenstance built into it:

- **Quantum physics** tells us we absolutely cannot predict the properties of a particle no matter how well we know its past history.
- **Chaos theory** shows many if not most systems of nature are extremely sensitive to the starting conditions. A nearly infinitesimal difference in the starting conditions can lead to completely different behaviors
 - Also called the "**Butterfly Effect**:" the way a butterfly flaps its wings in China might effect the weather patterns in Minnesota two weeks later

Theologian such as John Polkinghorne (a particle physicist who became an Anglican priest and theologian) suggests that God made the universe as "wholly other" and gave the creation the gift of this chance and happenstance to make it a place of "true becoming". The chance, happenstance given to nature allows the universe to evolve and give rise to novelty and new forms -- to become "creative"

5.3.3. Eschatology

Eschatology = The Study of the Last Things.

Modern Cosmology tells us that:

- The universe will die, either in "fire" or in "ice": in a collapse back to a great fireball, or in an eternal expansion where all structure is dissipated and all energy so spread out that the temperature will be near absolute zero everywhere

We must conclude, and theology must take into account, that only a redemptive act of God that contravenes the laws of physics can save the universe

5.4. Systematic Synthesis

The idea that science and theology offer views of reality that must be integrated is most radically seen in those theologians and philosophers who have tried to fully integrate views of reality offered by science into new theological theories. The two theological theories given as examples by Barbour are:

- 1. Alfred North Whitehead's: **Process Theology**
- 2. Pierre Teilhard de Chardin's **Point Omega**

(The following material is lifted from the session Survey of Theology 1, the Doctrine of God.

5.4.1. Alfred North Whitehead: Process Theology

5.4.1.1. Reality in Process Theology

- Process / change is the fundamental basis of reality (not matter, substances, essences. . .)
- Reality is composed of building blocks of processes called "actual occasions," or "actual entities," each with a certain degree of freedom to develop and influence adjacent processes
- God is the permanent, imperishable background of order for the developing processes
- God can act to influence and persuade the processes, but cannot violate the rules governing the processes.
 - God can try to persuade the murderer not to kill, but ultimately cannot violate the murderer's "free will."
 - God can try to persuade the processes of nature involved in an avalanche, but ultimately cannot violate the rules of nature's "free process"
- God both influences processes and is influenced by the processes. God is thus "a fellow-sufferer who understands" (Alfred North Whitehead)

5.4.1.2. Criticisms of Process Theology

- too radically compromises the transcendence of God
- hard to find the God of the Old Testament in the God of Process Theology

5.4.2. Pierre Teilhard de Chardin's Point Omega

- Universe is an *evolutionary* process constantly moving towards states of greater complexity and higher levels of consciousness
- There are no radical discontinuities or innovations in this evolution. From the beginning, there was a "biological layer" inherent in the fabric of universe, a "rudimentary consciousness" in all physical matter ("there is a Within to things" said de Chardin) that was the basis for the evolutionary development of life and consciousness
- "Critical points" of transitions include emergence of life on earth, emergence of human consciousness
- The universe's evolution is ascending towards **Point Omega**, which is both:
 - a union with God
 - the "force" attracting the evolutionary process
- God is at work:
 - immanent within the world, working in the process of its evolution
 - as the "attractive" force drawing the process to its divine goal and fulfillment in the "Omega Point"

Primary Reference

Religion and Science. Historical and Contemporary Issues, Ian Barbour. Harper, San Francisco, 1997. Chapter 4: Ways of Relating Science and Religion