

The Imagined Conflict: On Science and God

Sverre Holm

Revised version of Norwegian original with title:
Den innbilte konflikten. Om naturvitenskap og Gud
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SVERRE HOLM

Den innbilte konflikten

OM NATURVITENSKAP OG GUD

VERITAS FORLAG

For my grandchildren Eline, Filip, Ada, and Fredrik
with a hope and a prayer that you and your generation
will overcome the myth of the imagined conflict.

Commendations for English version

Holm's book is an excellent addition to the literature on science and religion. With a delightful Scandinavian flavour, and with the keen insight of a practising research physicist, Holm takes a balanced three-pronged approach to the topic – historical, scientific and philosophical. Amply supported by carefully curated, detailed research, he rehabilitates the science of the Middle Ages, illuminates in a fresh way the iconic historical controversies on the motion and age of the earth and reflects on contemporary thinking on the nature of evolution.

Showing a clear grasp of the importance of distinguishing science from worldview, Holm traces how the idea of conflict between science and God developed and why that conflict is imagined rather than real.

This book is a model of fair enquiry, and I thoroughly recommend it to anyone interested in understanding how science and the Christian faith can both coexist and thrive in fruitful dialogue.

JC Lennox MA MMath MA(Bioethics) DPhil PhD DSc FISSR
Emeritus Professor of Mathematics, University of Oxford
Emeritus Fellow in Mathematics and Philosophy of Science
Green Templeton College, Oxford.

In my travels to universities across Europe I have found that the idea that there is a conflict between science and God is still commonly accepted by many students. In this engaging and well researched book, Sverre Holm shows how absurd this conflict narrative really is. Not only did the book convincingly debunk the idea of an ongoing conflict, I also found that it increased my appreciation of science and deepened my love for the God who stands behind it all. Whatever your view on the relationship between science and God, you will find this book illuminating and insightful!

Michael Ots,
Field Director of FEUER
(Fellowship of Evangelists in the universities of Europe)
- a ministry of IFES

This magnificent and well written book by Sverre Holm, himself a distinguish scientist and member of the Norwegian Academy of technological sciences debunks the idea that science and faith are in conflict. In a masterly overview of both science and the Christian faith from a historical and theological perspective, he shows how the Christian faith has influenced the development of science down the centuries and rather than looking at faith as a 'God of the gaps' he demonstrates that many scientists throughout history, and indeed today, follow the thoughts of the 17th Century German astronomer and philosopher Johannes Kepler "O God, I am thinking Thy thoughts after Thee". Sverre Holm demonstrates how science and faith are complementary rather than antagonistic, and if science asks 'how' it is left to faith to ask the deepest 'why' questions.

Professor David Cranston D.Phil., FRCS.
Emeritus Associate Professor of Surgery University of Oxford
Emeritus Fellow of Green Templeton College Oxford
Clinical Director High Intensity Focused Ultrasound Unit

About the Norwegian original

"With its over 330 pages, it may be a demanding book for many to get started with, but those who do will soon discover that it is well and educationally written and easy to read" ...

"The imagined conflict is so good that I would say that Sverre Holm has here written a reference work for Norwegian debate for many years to come! It will be almost impossible to overlook this book if one makes a statement about God and natural science in Norway from now on. I hope!"

Tom Arne Møllerbråten, teacher, in Steg
(Journal for Christian community colleges), December 2021.

"If God exists, we live in a radically different world than if God does not exist. This is not a scientific question. Holm's book clarifies a number of interesting connections between science and Christian faith. For me, this is an important contribution to a comprehensive Christian philosophy. Holm does not mix scientific and philosophical premises."

Professor of Philosophy Ralph Vaags, University of Agder,
Vårt Land (Christian daily newspaper), December 2021

"For anyone interested in natural science in general, and society's and the church's relationship to scientific discoveries and new knowledge, the book is both affordable, well systematised and interesting. The 333 pages are packed with references, notes and facts, while it should be possible for readers without special subject expertise to understand and enjoy this unimaginably vast subject area and the accompanying existential questions."

Jan Risan, leader of the Salvation Army in Denmark
and Greenland, in Krigsropet (The Salvation Army), March 2022

This is a gold mine of a book, because it contains historical material and factual material that we need in order to answer the claims of conflict between natural science and Christianity.

Bjarte Ystebø, Norway TODAY (Christian weekly), March 2022

"These are serious questions, and Sverre Holm should be greatly thanked for the fact that, as a Christian scientist, he has entered into them with an honest mind, for inspiration and reflection for the rest of us."

Bård Hauge, Dagen (Christian daily), December 2021

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Introduction

The scientific revolution outshines everything since the rise of Christianity and reduces the Renaissance and Reformation to the rank of mere episodes, mere internal displacements, within the system of mediaeval Christendom.

Herbert Butterfield, historian¹

As the quote suggests, two major upheavals have greatly influenced our culture, one attributed to Christianity, and the other to science. Science emerged during what is known as the "early modern period," approximately 1500-1789. The defining years of this period mark the end of the Middle Ages and the French Revolution respectively. Central to this is the publication of Isaac Newton's great scientific work, *Principia*,² from 1687. It is commonly believed that Newton's work ended a long process where nature went from being a place where humans could find God's intentions, to becoming a type of mechanism. Despite this, the early natural philosophers still held steadfastly to the idea that this mechanism was initiated and driven by God, and that there was a purpose behind nature. It was precisely this belief in God that inspired them to believe in the possibility and value of natural science.

Today, the picture seems to have completely changed. Rather than thinking that Christian faith can stimulate scientific work, belief is perceived as an obstacle and something that has hindered science over the years. The success of science has led to its way of thinking influencing almost all areas, and for many, natural science has become a "theory of everything" and a replacement for religious faith. In this book, I pose the question of how this came to be and whether this is actually an imaginary conflict.

The book has three unique perspectives. The first one is historical. Here I will clarify misunderstandings about the role of the Christian faith in the history of science. It turns out that the Middle Ages laid the foundation for today's science, before the Scientific Revolution, despite the many who believe that this period was "dark". History also shows how the concept of "natural law", which was so prominent in the 17th century, initially seemed unthinkable without a lawgiver. This connection is forgotten in our time. The idea of a beginning, the Big Bang, has also led to physics and cosmology being less opposed to a belief in a creator today than before.

The second perspective is scientific. An example is how the Galileo conflict is seen in new light when the limitations of the science at his time is understood. It is important to let the science of the past speak on its own terms and not interpret it based on today's theories, as many natural scientists tend to do. Another example is how vague science is when faced with the question of human consciousness. Yet, many have strong opinions on how human beings originated. But how can we know that when we cannot even agree on what consciousness is?

¹ From the introduction of (Butterfield 1951).

² *Philosophiæ naturalis principia mathematica* or The Mathematical Principles of Natural Philosophy.

The third perspective is philosophical. The relationship between the Big Bang and the need for a creator is partly a scientific question, but even more it raises the deeper question of why anything exists at all. Issues related to evolution are often reduced to scientific questions as well. Here, I argue that the philosophical approach is just as fruitful, as it helps to distinguish what science actually says from what some scientists may think it says when they are instead promoting philosophical world views influenced by positivism and scientism.

To make some of the topics simpler to grasp, the book uses illustrations throughout. Another unique feature that sets it apart from many other books, is that it discusses all those aspects of science that have been viewed as controversial when it comes to the science-God question, from the Big Bang, life's long history on Earth, the Galileo affair, evolution and Darwinism, and to the question of human consciousness. The ambition is to provide a broad and thorough justification for how classical Christian faith can coexist with science. Some may be sceptical to this, while others may feel that it is unproblematic, but they cannot justify why. This may particularly apply to the topics of evolution and the origin of humanity. It should not be underestimated that there are some issues here that may be difficult to resolve. Therefore, the ambition is to discuss this in depth and propose solutions. In the process, I relate my own personal struggle with these questions. Later in this Introduction and in Chapter 1 I also tell the story of how I came to embrace the Christian faith, despite my background where almost everything related to technology and science alone.

The book is also intended to encourage more young Christians to pursue a scientific career without fear of having to compromise their faith. A part of that is to highlight the limitations of natural science. Just as science cannot be used to "prove" Christian faith, neither can it be used to defend materialism and atheism. On the contrary, the book ends with some remarks on where the real conflict lies, namely in the poor justification of science that a naturalistic view of nature and man can provide.

God has arranged all things

The statement that "you have arranged all things by measure and number and weight" has long been a source of inspiration for me.³ It was frequently quoted in the Middle Ages, and Professor Peter Waage (1833-1900) at the University of Oslo must have had it as his motto, see Figure 1. He is known for Guldberg and Waage's law of mass action in chemistry, dating from 1864.

Waage had the quote painted in the ceiling of his office at the University of Oslo. His chemistry book from 1897 quotes it when he talks about how all chemical compounds have an unchanging, specified composition.⁴ I have been surprised at how much more influenced the history of science is by ideas from the Bible than I originally thought, as Waage's example shows. My assertion is that the high standing of the Bible in European culture contributed to science advancing as far as it did precisely here, even if the Bible is not the sole cause.

Other factors may include favourable climate, well-developed agriculture that could sustain a large population, healthy competition between the many European states, and Latin as a

³ From the Wisdom of Solomon 11:20. This book is one of the deuterocanonical books, which are writings from the time between the Old and New Testaments. Some include them in the Bible, including the Catholic Church.

⁴ From the introduction of (Waage 1897).

common language. The latter is due to the church which has influenced history both with bullies and saints.⁵

Some of the most prominent natural philosophers and scientists have become almost like friends during the process leading up to this book, and I look forward to introducing them here. You will become acquainted with Galileo Galilei, Blaise Pascal, Isaac Newton, William Buckland, James Maxwell, Lord Kelvin, Pierre Duhem, and Albert Einstein, among others. Most of them are Europeans, but we will also briefly visit Indian Nilakantha Somayaji, Persian Ibn Sahl, and Chinese Zu Chongzhi. Some of the researchers also contributed to the philosophy of science, and here we find that both the experimental method and the idea of natural laws have theological justifications.

Many books have been written about the supposed conflict between Christian faith and science, and historians, theologians, and philosophers have all contributed. I write as an active researcher in physics and believe that this can provide a valuable and different perspective. This is important when it comes to understanding how new scientific knowledge is found, and how new, exciting, and fashionable scientific theories may not necessarily stand the test of time. However, with today's strong specialisation in science, I am also aware of the limitations when I venture into areas that differ from my own. I am thinking particularly of biological evolution and theories of consciousness, which are now so central to the shaping of the relationship between God and natural science.

I have had to delve into fields such as history, philosophy, and theology. It is relevant to note how historians criticise a specific type of historiography exemplified in how historians of the Enlightenment did not judge historical phenomena based on their own terms, but according to their own rationalist metrics. The treatment of the church in particular suffered from this perspective.⁶ I therefore make an effort here to understand the past on its own terms. It is of course not entirely negative to use the present to understand the past, but I try to avoid it because this type of history often leads to a categorisation into heroes depending on whether they stood on the "right side" or not. This interpretation of history in light of the present is referred to as presentism, and Butterfield was one of its earliest critics.⁷

Such a choice of perspective sometimes plays a decisive role, for example, in understanding Galileo. Because he turned out to be right in the end, it is easy to make him a greater hero than he actually was, as is frequently done. My ambition is to understand Galileo's science from the

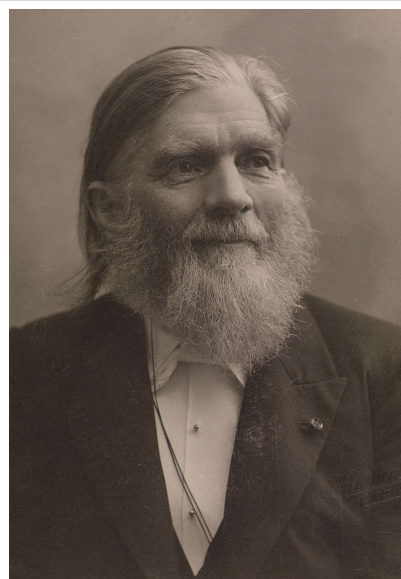


Figure 1 Peter Waage (1833–1900) was a professor of chemistry at the University of Oslo. Early in his life, in an award-winning student essay from 1857 he quoted "God has arranged everything according to measure, number, and weight" in Greek. He also quoted it near the end of his life in a speech in Stockholm in 1898 at the memorial marking 50 years since the death of the chemist Berzelius.

He was the first chairman of the Norwegian Christian Youth Federation (now YWCA-YMCA Norway), where he served from 1880 to 1900. Image: Wikipedia.

⁵ "Bullies and Saints", from the title of (Dickson 2021).

⁶ Page 57 in (Kjeldstadli 1999).

⁷ (Butterfield 1931).

perspective of the time when he lived, as opposed to what we consider correct science in hindsight.

My selection from the history of science is, of course, not exhaustive. I deliberately chose the areas most associated with conflict, such as astronomy, cosmology, palaeontology, and evolution. As a result, important areas such as medicine and chemistry are hardly mentioned. My starting point is that the alleged conflict between science and God has been made more significant than it actually is. This is not really about apologetics, but about returning to the constructive interaction that, for the most part, has always existed.

There is a great need to point this out. For example, a recent Norwegian high school textbook claimed that Galileo pointed his telescope towards the skies and observed that Copernicus' theories were correct. In reality, both he and others knew that observing planets like he did, was not sufficient to establish the theory; it was necessary to observe motion of stars. Galileo is also described as someone who served as a role model as he was always willing to reformulate his hypotheses and assumptions if observations and experiments didn't support them. Perhaps the author was influenced by Einstein, who called Galileo "the father of modern science," when in this way he was creating "his own" Galileo.⁸ The real Galileo, who avoided reporting observations of double stars which were unfavourable for his own hypothesis, does not support the image of him as a role model. Unfortunately, many textbooks contain idealising examples that promote an imagined conflict perspective. Thus, in this book, I consciously avoid terms like "father of science" because they so easily lead to unrealistic hero narratives.

Another example comes from *The King's Mirror*, a philosophical and pedagogical text from the mid-13th century. It was written by an unknown author in old Norse and is considered to be Norway's most important literary work from the Middle Ages. It is a dialogue where a king gives his son education in politics and morality. *The King's Mirror* or "speculum regale" belongs to the European speculum genre which was popular between the 12th and the 16th centuries with the ambition to be encyclopaedic, but more often served as instructional manuals.

The King's Mirror contains several examples of scientific ideas of its time, which I will give examples of in later chapters. It is a pity that in an introductory essay to the Norwegian edition published in 2000, an artificial conflict is presented regarding the ancient division of the spherical Earth into five belts or zones.⁹ Since it was too cold in the far north and south and likely too hot around the equator, only the two temperate zones, one in the north and one in the south, were considered inhabitable. At the time it was unknown to Europeans that humans inhabited the southern temperate zone, like Australia and South America. It is true that the church, according to the best science of the time, was sceptical to the claim that there could be a human population in the southern temperate belt, as it was thought impossible to cross the hot area around the equator.

The King's Mirror only comments that "If people live as near the cold belt on the southern side as the Greenlanders do on the northern, I firmly believe that the north wind blows as warm to them as the south wind to us."¹⁰ In passing, it should be noted how obvious it is to the author that the Earth is not flat, despite the myth to the contrary. In the introductory essay however, it is claimed that the author of *The King's Mirror* here is exploring dangerous ideas, and that in the early 1300s,

⁸ See page 271 in (Einstein 1954)

⁹ (Bagge 2000).

¹⁰ See page 16 in *The King's Mirror* (Larson 1917)

Peter of Abano, a medical professor in Padova, and Cecco da Ascoli, an astronomer in Bologna, were burned by the Inquisition for claiming that such a human population existed.

Respected historians of science, however, say that no scientists ever lost their lives because of their scientific views.¹¹ This needs clarification. It turns out that Peter (or Pietro) d'Abano, who was also an astrologer, was charged with fraud, heresy, and magical arts, but acquitted. He was, however, charged again and sentenced after his death. The astrologer, not astronomer, Cecco d'Ascoli was first warned after casting the horoscope of Jesus Christ and claiming that the fate of God's son was determined by the stars and not by God.¹² When he would not let go of his claim, he was later convicted and burned for heresy. A closer look therefore shows that neither of the two cases had anything to do with science, and that the conflict is contrived. Today, of course, we find these sentences unheard of, but they may be more understandable if we compare the mediaeval view of theology with how we view the practice of medicine today. We are quick to crack down on quackery if anyone without a formal education claims to be a doctor.¹³

The emphasis on history and philosophy in addition to science means that there is a great degree of interdisciplinary work behind a book like this. Interdisciplinarity is something the Austrian physicist Erwin Schrödinger encouraged. He received the Nobel Prize in 1933 for important work in quantum mechanics but had interests far beyond his own specialisation. In the preface to a book that would turn out to inspire molecular biology, he comments on the expectation he met that he should not write about anything other than his own field of expertise. At the same time, he observes that everyone has a craving for unified and comprehensive knowledge. To avoid the fragmentation of knowledge, someone must be willing to bring together facts and theories from many areas. This is true even if we only have second-hand and incomplete knowledge, and even if there is a risk of making fools of ourselves, says Schrödinger.¹⁴ Similarly, that is the chance I take here.

My own journey began with a desire to understand how things are connected. It started with opening up clocks, radios, and engines and trying to put them back together without too many leftover parts. I grew up in a residential area where all our neighbours worked in the research institutes which are located just north of Oslo. The neighbourhood where I lived my first 18 years was called Research Garden¹⁵, and already in junior high school, I was determined to study technology. This led me to what I have been working on almost my entire life, namely making things work better - whether it was to create better images of the Earth from a satellite or to see into the human body with medical ultrasound. At the same time, my curiosity has led me to pursue questions on both how and why things work. When ultrasound waves enter the body, interact with cells and tissue, are reflected, and can be used to create images that can provide medical diagnoses, what is the physics behind that?¹⁶

Little by little, I have been struck by a side of science that we do not talk about so much, namely the creative, wondering, and almost mystical aspect. It is common to emphasize the rational methods for testing ideas and hypotheses. This can make natural science seem dry, rule-bound,

¹¹ See the first page of the Introduction in (Lindberg and Numbers 2003)

¹² These accounts of conflict are presented without reference to any source in Andrew Dickson White's "The Warfare of Science with Theology" (1896) and are mentioned on page 59 of (Kretschmer 1889), so they go far back in time.

¹³ See pp. 119–123 in (Hannam 2011). Hannam has also written a thesis on this topic, (Hannam 2003).

¹⁴ Introduction of (Schrödinger 1944)

¹⁵ The Norwegian address was "Forskerhagen"

¹⁶ Eventually this became a book, (Holm 2019).

and a bit boring. But natural science also requires creative imagination, built on a foundation of in-depth knowledge of the state-of-the-art in the field. Einstein also mentions that there is no logical way to formulate natural laws, "only intuition."¹⁷ When it comes to art and other "creative" professions, this goes without saying, but intuition is also a very important part of science.

The big questions

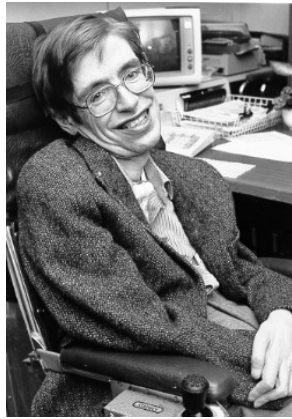


Figure 2 Stephen Hawking (1942-2018), English theoretical physicist, cosmologist, and author (Wikipedia)

One aspect of creativity is the ability to ask questions that can be so complicated that we cannot expect to find answers to them. The fact that we are even asking these questions shows something about our humanity and God-given curiosity. The physicist Stephen Hawking, for example, wondered what it is that "breathes fire into the equations and makes a universe for them to describe."¹⁸ Fire is associated with the ancient four elements: water, earth, air, and fire. Fire can be dangerous, but it will also remove slag from iron, and it may be related to the life-giving Sun. Equations come to life, but how and why? Hawking and I are building on a whole series of natural scientists who have come before us. We are children standing on "the shoulders of giants." Newton is usually associated with this expression, but he borrowed it from Bernard de Chartres who, in the 12th century, in this way showed his enthusiasm for the Greek "giants" of antiquity.

Another of these giants was the Hungarian American Nobel laureate Eugene Wigner. In 1960, he wondered why the language of mathematics fits physical laws and said that this is a miracle and a wonderful gift, which we neither understand nor deserve.¹⁹ Why are there natural laws? They cannot be scientifically justified but are something we assume or believe. Further, what is it that makes equations, which express abstract ideas in our minds, work so well to express how tangible nature works? Is it not strange that Wigner received a Nobel Prize for contributions to the theory of the atomic nucleus and the elementary particle that was based on a tool he did not understand, and which he regarded as a miracle?

Albert Einstein thought along similar lines when he said that "the eternal mystery of the world is its comprehensibility," and that "the fact that it is comprehensible is a miracle."²⁰ Einstein links the mystery to the properties of humans in saying that it is as if our intellect was made to understand the world. Like Wigner, one can say that Einstein expressed his theory of relativity with a tool shrouded in mystery.

Barrow and Tipler are also puzzled by the laws of nature, but just as much by the fundamental constants of nature that are involved in them. "As yet", they say, "we have no explanation for the precise numerical values taken by these unchanging dimensionless numbers."²¹ An example is Newton's law of gravity, where the strength of gravity itself is such a constant of nature. If it had been much weaker, we would probably have achieved a new world record in high jumping, but

¹⁷ See page 226 in (Einstein 1954).

¹⁸ From Hawking's bestseller (Hawking 1988).

¹⁹ Wigner's article from 1960, (Wigner 1990) even has its own Wikipedia page

²⁰ Quotes from pp. 292–293 in (Einstein 1954), often shortened to «The most incomprehensible thing about the world is that it is comprehensible» which is one of Einstein's best known quotes.

²¹ Chap. 2.1 in (Barrow and Tipler 1986).

the Sun would have had to be much larger to avoid collapsing. Such a Sun, however, would not have emitted life-giving light and heat, but rather radio waves that carry too little energy to sustain life.²² On the other hand, if gravity were just a little stronger, matter could collapse in on itself. This would make stars, galaxies, and planets extremely small. Barrow and Tipler continue to say that "The fortuitous nature of many of their numerical values is a mystery that cries out for a solution."

Other puzzles which many believe have been more or less solved, are pointed out in an introduction to evolution: "Two other major and largely unsolved problems in evolution, at the opposite extremes of the history of life, are the origin of the basic features of living cells and the origin of human consciousness."²³

Adding the mystery of the origin of the universe to that, there are therefore at least three major unsolved, and perhaps even insoluble, scientific questions: how the world came into existence, how life began, and how our consciousness came to have the properties that it has. The latter is what enables us to ponder these questions at all.

The most fundamental question was probably posed by the German philosopher and mathematician Gottfried Leibniz in the early 1700s when he wondered why "there is something rather than nothing, as after all, nothing is simpler and easier than something." This question goes far beyond technology, physics, and biology to creation and God.²⁴

This book begins in Chapter 1 with the idea of God's two books, nature and the Bible. This is an idea with deep roots back in time. Chapter 2 discusses the creation and how good, beautiful, and surprising it is. Here I could choose many different topics, but I start with something that I have encountered in my own research, namely the remarkable ability of humans to communicate complex ideas. Chapter 3 is about the church's alleged opposition to the rise of science throughout history. This is about trying to understand the Middle Ages in its own light and not as a "dark" detour on the way to our own "enlightened" times. I also delve into the conflict surrounding Galileo Galilei of the 17th century and why Tycho Brahe's model of the solar system was considered the best for a long time. Chapter 4 is concerned with how both life and the universe had a beginning. A new understanding of fossils from the late 18th century led to a complete reassessment of the age of the Earth and life. Eventually, the idea emerged that life is neither eternal, as the Greeks believed, nor created in a few days. Instead, life has both a beginning and a long history, and different life forms are interconnected. Furthermore, the beginning of the universe with the Big Bang was established as sound science.

The second half of the book is about evolution and the uniqueness of humans, particularly when it comes to consciousness. Here, a foundation in philosophy of science is important, and Chapter 5 is dedicated to that, including thinking about what the limits of science can be. Chapter 6 on evolution first discusses what is not part of the theory of evolution, but what many



Figure 3 Albert Einstein on a boat trip in the Oslo Fjord in 1920 with the geologists Heinrich Goldsmith (left) and Jakob Schetelig (right). Photo: Halvor Rosendahl, University of Oslo

²² Page 106 in (Lewis and Barnes 2016).

²³ Chapter 7 in (Charlesworth and Charlesworth 2017).

²⁴ Leibniz question - and answer – can be found in paragraphs 7 and 8 in (Leibniz 1998) from 1714.

people mistakenly think is, such as the origin of life. I mainly examine philosophical arguments to distinguish between evolution as a science and evolutionism as a worldview, but also present some scientific arguments. Chapter 7 is about what a human being is and how it is unique in nature. I was particularly surprised by how little science has to say when it comes to understanding what human consciousness actually is, as noted. I conclude in Chapter 8 by discussing the origins of the conflict myth.

This book can be read in different ways. Chapters 3-8 largely build upon what I have written in Chapter 2 about our place in the universe and cosmic evolution. There, I paint the big picture and show the wonder of how the Big Bang 14 billion years ago has led to intelligent humans. Chapter 3 is about astronomy in Galileo's time and is the most demanding in terms of science. Although it is central, some parts can be skipped. The philosophy of science in Chapter 5 is a necessary background to understand evolution in Chapters 6 and 7, and these three chapters are best read together.

The Appendix contains reflections from someone who is not a theologian on how the ideas presented in particular in chapters 3, 4, 6, and 7 relate to the Bible, in an attempt to understand how the Bible and natural science can be understood together.

1 God's two books

We conclude that God is known first through Nature, and then again, more particularly, by doctrine, by Nature in His works, and by doctrine in His revealed word.²⁵

Galileo Galilei, 1615, after Tertullian (160–220)

The idea of God's two books has been with the Christian church from the very beginning as the quote indicates. The two books refer to God's world and God's word, and the first book, general revelation, is found in nature and creation. The second book, or special revelation, is often called grace. It is where God through the Bible shows us what we cannot discover in any other way – such as God's goodness, the triune image of God, God becoming human, Jesus' death to reconcile the world with God, and Jesus' resurrection.

The special revelation also influences our approach to nature. Among the important aspects for science is God's faithfulness, or immutability, which gives us the expectation that nature and the laws of nature are unchangeable.²⁶ The second aspect is God's omnipotence, which means that God was free to create the world as he wanted to. Therefore, we cannot simply use logic to deduce how the world behaves because we do not necessarily understand God. Experiments and observations are necessary.²⁷

The relationship between general and special revelation is illustrated in Figure 4. Above the horizontal line, we see how God is the originator of both books. This represents an objective truth, or "true truth," as theologian and philosopher Francis Schaeffer expressed it.²⁸ By that, he meant that this truth is not just something I subjectively believe to be true as postmodernism will have us believe, but it is something which is true independent of us. True truth represents how the world truly is. The figure also illustrates how all truth, no matter its source, is God's truth.²⁹ We, who are below the horizontal line, only have limited insight, shown here by dotted lines. In philosophical terms, what is above the line deals with ontology, and what is below deals with epistemology.³⁰

Regarding theology, we see "in part" (1 Cor. 13:12). Yet, some claim that the Bible is so clear that there is no need for interpretation. Doesn't that demonstrate a shortsightedness on behalf of the speaker? It is as if I, coming from the capital where most people live, were to believe that I am the only one who speaks my native language "correctly" and that those from other areas of the country speak with an accent, when in reality we all have accents, whether it is common or not.

²⁵ Letter to the Grand Duchess Christina of Tuscany, 1615.

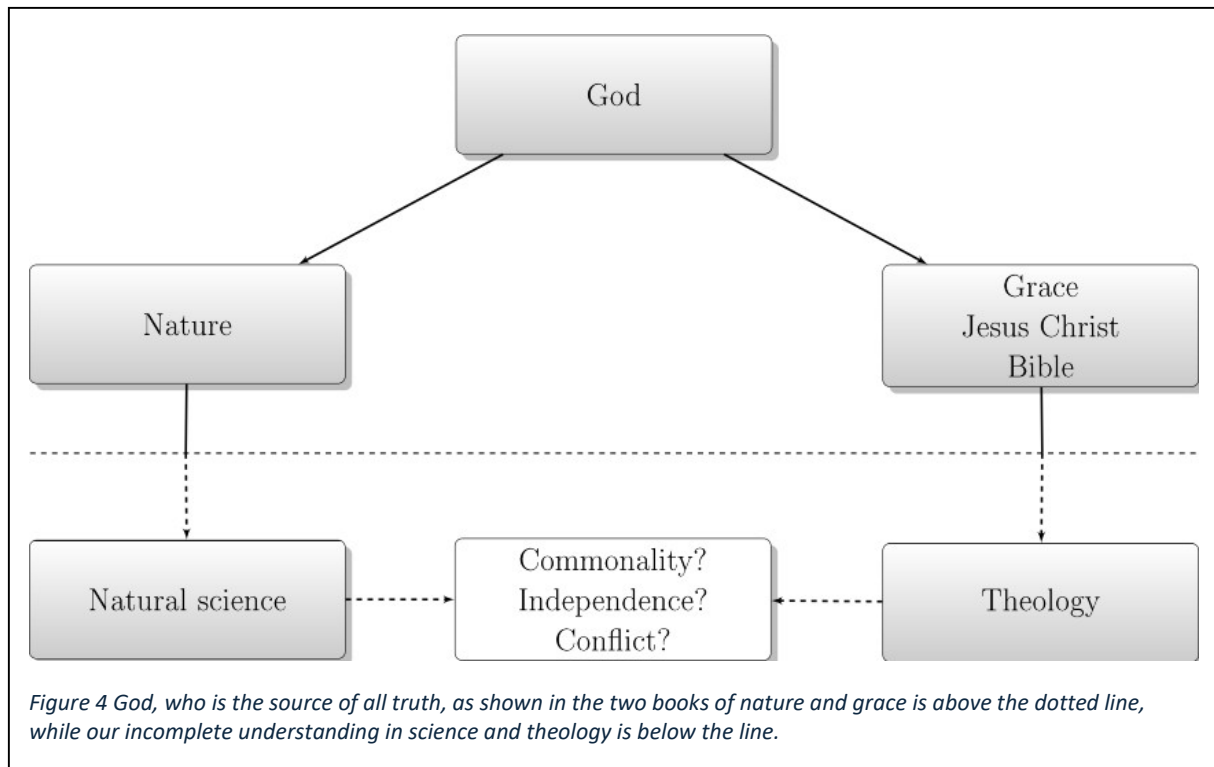
²⁶ This was important for Albert Einstein, as will be seen later in this chapter.

²⁷ Isaac Newton used this argument as will be clearer in Chapter 5.

²⁸ The expression «true truth» is from Chapter 2 in *Escape from Reason*, page 218 in (Schaeffer 1990).

²⁹ "All truth is God's truth" is a paraphrase of "let every good and true Christian understand that wherever truth may be found, it belongs to his Master" from book II, Chap. 18 of (Augustine 397).

³⁰ Ontology is the study of what exists, from Greek, *ontos*, "being", and *-logia*, "the doctrine of". Epistemology is the doctrine of knowledge, from Greek *episteme*, "knowledge".



All natural scientists probably agree that "nature tends to hide itself," as Heraclitus, the Greek philosopher who lived around 500 BC, said. A common view in natural science is what we call scientific realism. The starting point is that there is an objective world which most scientists would agree to. Again, theology gives the surest way to justify its objectivity, with the idea that it is not us who have created the world, but God. Scientific realism means that we acknowledge that there are truths about nature that are independent of us, but our knowledge of them is limited. However, we believe that we can approach the truth with better theories and more knowledge.

Therefore, intellectual work and great efforts are required to understand both science and theology. But we can make significant progress with a few principles such as unity and coherence. For science, it means that independent branches of science must agree with each other. An example is dating of life from biology and zoology, dating of the Earth from radiometric dating, and dating of the universe based on measurements of star velocities. If, for instance, the universe were to be found to be younger than the Earth, it is clear that science is inconsistent and immature. Similarly, an important principle for interpretation of the 66 books of the Bible is that they speak with divine inspiration, truthfulness, and authority.³¹ Thus they speak with a single voice, since the Bible is a unity given to us by God. Another principle is a willingness to follow it, as expressed by Augustine: "Your best servant is the person who does not attend so much to hearing what he himself wants as to willing what he has heard from you".³²

Realistically, we have to acknowledge that both theology and science can only have a limited perspective. Here, I emphasize the historical development of the relationship between the two and examine how this relationship has changed over time. There is no reason to believe that it will not change in the future as well.

³¹ As for instance stated in the Lausanne Covenant, <https://lausanne.org/content/covenant/lausanne-covenant>

³² Book 10,26 in St. Augustine Confessions, 397-400 AD.

As noted in the epigraph of this chapter, the early Church Fathers agreed that God reveals Himself in nature.³³ They based it for instance on the creation story where God says, "Let there be lights in the vault of the sky to separate the day from the night, and let them serve as signs to mark sacred times, and days and years" (Genesis 1:14). Also, note how one of the creation psalms uses active verbs to describe nature: "The heavens declare the glory of God; the skies proclaim the work of his hands. Day after day they pour forth speech ..." (Psalm 19:1-2).

When Jesus was hailed on Palm Sunday, some wanted to silence his followers. But Jesus replied, "if they keep quiet, the stones will cry out" (Luke 19:40). When the testimony from Jesus' followers has been less clear, and our time may be such a time, only the testimony of creation remains. It is for a good reason that many find spirituality in nature. Furthermore, since Jesus was on his way to Jerusalem, he may have been thinking about more than just natural stones. Perhaps that is what we witnessed when the fire in Notre-Dame Cathedral in Paris in 2019 created grief far beyond the ranks of churchgoers?

One could be tempted to think that nature by itself is enough to form a complete picture of God. But special revelation states that more is needed, for "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" (Hebrews 11:3). Central to the Bible's testimony of the character of God is the person of Christ who said that "anyone who has seen me has seen the Father" (John 14:9). This makes Christian revelation different from the revelation in for instance Islam, where the book of the Quran is claimed to be the revelation. Therefore, it is so important to read the Quran in its original Arabic language. In contrast, in the Christian faith, revelation primarily refers to the person of Jesus Christ.

Natural science and theology can interact in several ways, as shown at the bottom of Figure 4. I deliberately say natural sciences and not science here, to make it clear that humanities and social sciences are not necessarily included. There can be commonality and harmony, or complete independence, or there can be conflict between them. Towards the end of this chapter, we will see that the relationship between them can be characterised in as many as seven different ways.

There are often clashes when representatives from either field gives in to the temptation to go beyond their own areas of expertise. Unfortunately, both natural scientists and theologians have done this throughout history, and moreover, it has happened so frequently that many now see nothing but conflict. Nevertheless, it is more accurate to say that throughout history, there have been all sorts of relationships, and today's historians of science will primarily say that the relationship between natural science and theology is marked by complexity.³⁴ But since general and special revelation come from the same God, we should strive to understand the deep connection between them. I consider this work to be in accordance with the message of the challenging statement of Jesus' Beatitudes' that "blessed are the peacemakers, for they will be called children of God" (Matthew 5:9).

Francis Bacon was one of the first to formulate the scientific method, despite not being a scientist himself. The two-book metaphor was clearly something he had in mind as he said that "let no man upon a weak conceit of sobriety or an ill-applied moderation think or maintain that a man can search too far or be too well studied in the book of God's word, or the book of God's

³³ See pp. 57-63 in (Harrison 2015).

³⁴ Complexity as a characterisation is due to (Brooke 1991), page 5.

works, divinity or philosophy”.³⁵ To the surprise of many, Charles Darwin endorsed this view and quoted Bacon on page II of the *Origin of Species*, in all editions from the first in 1859 until the final one in 1876. Bacon could have taken this idea from the medieval universities. A good example is found in the seal of the oldest university in Scandinavia, Uppsala University, as shown in Figure 5, saying “Truth in grace and nature (*Gratiae veritas naturae*). Like many of the medieval universities, Uppsala University was established in 1477 by a papal decree, issued by Pope Sixtus IV. In the university's seal, we see that nature from below and grace from above, unite in truth.

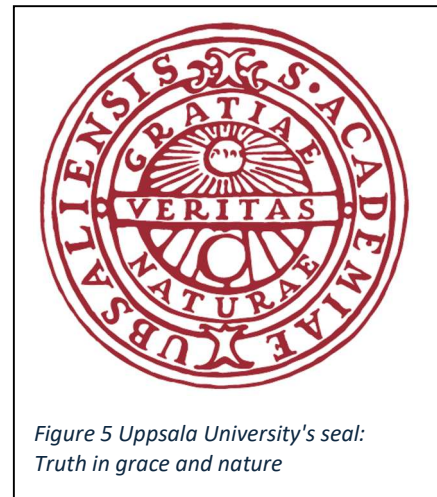


*Figure 5 Uppsala University's seal:
Truth in grace and nature*

Not only the Middle Ages were marked by the special revelation. It characterises our time to the highest degree as well. British historian Tom Holland recently admitted how wrong he had been about Christianity. Holland is known for his popular portrayal of Greek and Roman history, and now he had realised that his own values and morality are neither Greek nor Roman, but thoroughly Christian.³⁶ The idea that we are all equally valuable permeates Western culture. But this idea does not originate in science. Nor is it self-evident and obvious, even though many would like to believe so. The idea of equality is a consequence of the notion that we are created in God's image, and that Christ died for high and low, poor and rich. This affects all Western culture, whether we believe in God or not, says Holland, and these values are given to us from the Bible.

In this book, I build on the assumption that there exists an almighty and personal God independently of us. This is not one of the limited gods of the Greek or the Norse pantheon. Neither is God like in pantheism where there is no distinction between the world and the deity, nor is God an imagined deity that only exists in our minds. There are many good arguments for why an almighty and personal God exists, but this is not within the scope of this book to present. We can to some degree find out something about him by looking at ourselves or nature.

In addition, I assume that God has addressed us over a long time and through many different people. Their records have been preserved for posterity, and the collection of records is what we call the Bible. God has given us the Bible and preserved it through the ages because of his desire to communicate with us. There are many arguments for the reliability of the Bible, but they will not be presented here. I am going to quote from the Bible because of its unique perspective, but also because it has been extremely influential over time, and much more than we realise of our mind set has been shaped by it.

In sum I assume that “He is there and He is not silent”, which is the title of Francis Schaeffer’s book from 1972 that had a profound influence on me when it came out.³⁷

Does science make religion unnecessary?

Many of the scholars from earlier times would probably have found it difficult to understand the modern view that God's two books – nature and the Bible – can be perceived to conflict with each other. Nature has now assumed a superior role, and for many, natural science has become

³⁵ Francis Bacon, *The advancement of learning*, 1605.

³⁶ Holland’s book on the shaping of the Western mind is well worth reading, (Holland 2019).

³⁷ The third book in Schaeffer’s Trilogy, (Schaeffer 1990).