Limitations of Science

The inexplicable, god, and its development in science
20th Century Thinking about Science (ASQ)
Florian Sihler, Aug 16, 2022

Since the dawn of mankind, humans are trying to understand how the world works. Their explanations, especially at the beginning, were dominated by a divine view of the world, which was supplemented by more and more science-based knowledge over time.

This elaboration gives a brief overview of the history of the most important changes in the scientific worldview and their limitations, focusing on western cultures. Furthermore, the meaning of those limitations will be discussed, using the relationship to a god of some important scientific-contributors.

It turns out that an (even imagined) limit in the perceivable worldview is not beneficial to scientific research. The union of religion and science even seems to be favorable.

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1 Introduction

When talking about the origins of science, Aristotle is one of the most important figures, shaping the basic cycle of induction and deduction and laying the groundwork for western science.[1] While Aristotle tried to fathom the world and its causal workings, he still believed in a god/in something divine. His famous work "Metaphysics" establishes the science of the divine (theology) as one of the three important pillars, next to the ontology and the science of general principles [3]. However, at such an early stage it may seem logical to use belief (as belief in something higher, something divine) to fill in the blanks that science is unable to explain (as of yet).

These days we are much more "enlightened" and informed about how the world and how we – as humans – work,[2] which might question the need for belief. Physics, biology, chemistry, mathematics, and especially the information-technology revolution, opened up areas that were unthinkable at the time. Some of those discoveries, such as Galileo's heliocentric worldview or Darwin's theory of evolution, can even be equated with blasphemy from the perspective of the (Christian) church – as they have been at their time of discovery.

Still, a lot of modern scientists, like Sir Isaac Newton [51, p. 315] or Jérôme Lejeune,[3] do believe in a god (or a higher power in general), others like Richard Feynman [21, 9] and Steven Hawking[4] do not. As an example, the following quote expresses Hawking's opinion quite well:

> One can't prove that God doesn't exist. [...] But science makes God unnecessary. [...] The laws of physics can explain the universe without the need for a creator. (Stephen Hawking[5])

Overview • In the following, this document tries to assess the question of whether the idea of any higher being may be beneficial, in form of e.g. ethical requirements, or if it hinders scientific development. Section 2 will start with a brief overview of the history of scientific development and the ways religious beliefs have hindered or eased the process. After this, Section 3 will take a look at present theories on how to combine or separate religion and science. Section 4 will elaborate on how information technology changed the view on the concept of consciousness and the mind-body problem. To sum it up, Section 5 and Section 6 try to assess a conclusion by using the previously discussed findings.

Wording • Some words have multiple meanings depending on the context, e.g. belief. To clarify their usage in this document they are explained here as a way of guidance. All of the following definitions stand, if not stated explicitly otherwise:

Belief: Will be used as "belief in a higher power, something devine".

God: Will be used as an abstract name for a higher being and does not necessarily refer to the Christian god.

Whenever the word *church* or *religion* is used it will be accompanied with a specification, stating which church or religion is referred to (as long as it is of importance).

⟨1⟩ https://www.britannica.com/biography/Aristotle   (Feb 24, 2021)
⟨2⟩ Or at least we think we are.

⟨3⟩ https://lejeunefoundation.org/jerome-lejeune/   (Jan 16, 2021)
⟨4⟩ https://time.com ⬸ 5199149   (Jan 16, 2021)
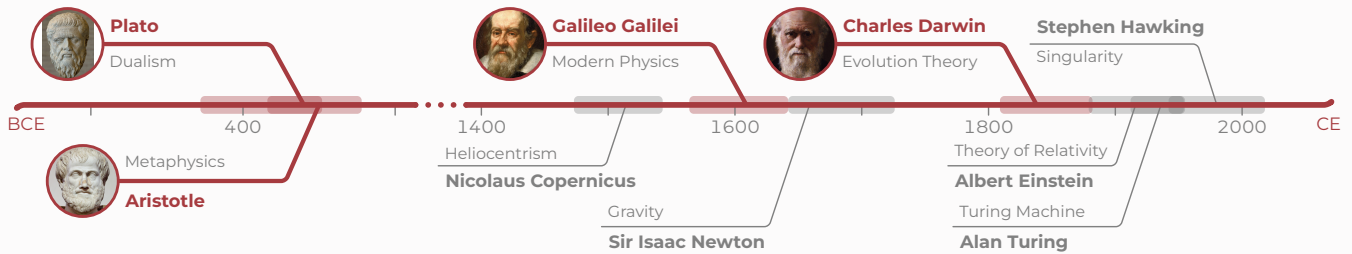⟨5⟩ https://abcnews.go.com ⬸ 11571150   (Jan 17, 2021)

Figure 1: Timeline of the presented persons. Those grayed out are left as a reference for other mentions in this document (photos by wikimedia [53]). Rounded rectangles (⬤ and ⬤) denote the full life span of the respective person.

2 History

This section will give a brief overview of some of the important contributions in history and how they interact with the concept of a god. As a summary, Figure 1 shows all the people mentioned in this section (and some more as a reference).

Plato • The Athenian philosopher Plato, a disciple of Socrates, lived in ancient Greece roundabout 400 BCE. While he is probably most famous for his school of Platonism, this document will focus on his views on consciousness and the interaction between body and mind.

Plato founded the Subject-Object-Problem, which was probably processed epistemologically by Thomas Hyde in his mind-body dualism [39] (see Subsection 4.1). From Plato's point of view, living beings are a construct of an ephemeral body and an immortal soul, whereby the soul is the life principle and the actual self of the living being at the same time.⟨6⟩

Aristotle • The Greek polymath and philosopher Aristotle was a student of Plato and worked directly with him and later independently. His views on dualism are quite similar, he even indulged in the theory of multiple souls, stating different kinds: some of which die with the body, while others remain [3, 26].

In his famous work "Metaphysics" Aristotle writes about "Being", presumably heavily influenced by Plato. Aristotle states metaphysics as a science that takes precedence over all other sciences, characterized by three pillars [3]:

- *Ontology*, asking about what "Being" is (in the highest degree).
- *Theology*, asking about existence and the unmoved mover as the primary cause for motion in the universe.
- *Meta-science*, dealing with evidence and first principles of thought.

Yet, all the content of the metaphysics-collection, dealing with the character of definitions, identity, causality, and more, exceeds the scope of this document. The most important consensus to be taken from it is the perception of the mind (or "soul") as something divine, never being able to be explained by the sciences, while the body (the matter) is physical and examinable.

⟨6⟩ https://spektrum.de ⨝ dualismus   (Jan 17, 2021)

Copernicus and Galilei • In 1543 Nicolaus Copernicus created the heliocentric model, placing the sun at the center and all other planets of the solar system orbiting around it [13]. However, the model contradicted the old Testament's geocentric worldview,⟨7⟩ which is why it was not widely accepted for roundabout 150 years until it was finally proven by Sir Isaac Newton.

One of the most famous representatives of the heliocentric model is Galileo Galilei, who got into a dispute with the Christian Church in the early 17th century [22]. While the Church allowed him to speak of the heliocentric system as a hypothesis (he was even encouraged by Pope Urban VIII), Galileo's work "Dialogo" [23] overran the desired boundaries and 'earned' him house arrest and a teaching ban. It was not until November 2nd in 1992, that Galileo was rehabilitated by the Catholic Church.

Charles Darwin • In his work "On the origin of species" [15], Charles Robert Darwin published his theory of evolution in the year 1859 and was heavily criticized only one year later in a publication named "Essays and Reviews" [49] mostly written by members of the Church of England.

Although the theory of evolution gained acceptance in science rather quickly, it has been labeled a heresy by some (Christian) Church officials (e.g. in the aforementioned "Essays and Reviews" [49]) and has left an ongoing conflict in some countries, such as the United States of America. In these countries, a not insignificant number of so-called "Creationists" believe in a world history faithful to the bible (whereby creationism is represented in many religions [25]) or in something called "Theistic Evolution": an evolution that is compatible with religious belief and (at least from their perspective) a proof of gods design.

Alan Turing • As one of the most important code breakers during the Second World War, Alan Turing introduced one of the elementary computer models as early as 1936: the Turing machine [50]. While the discovery as such was already revolutionary, it laid the foundation for research in artificial intelligence, opening up a whole new perspective for human consciousness. Furthermore, the Turing test (based on an idea by Alan Turing) is an example of numerous tests that attempt

⟨7⟩ See https://biblia.com/bible/esv/joshua/10/12-13   (Jan 23, 2021)

to get to the bottom of the peculiarity of the human mind (see Subsection 4.1).

Nowadays, a lot of people believe in a technological singularity, a hypothetical point in the (near future) where machines and artificial intelligence exceed human capacities and grow uncontrollably [18]. Amongst those are Elon Musk and Stephen Hawking, strongly believing in the capabilities of artificial intelligence.⟨8⟩

3 Theories

A lot of people – scientists and theologians alike – have tried to model possible relationships between science and religion.

This section takes a closer look at four of the most popular models using the names coined by John Polkinghorne [40]: (i) the incompatibility model, (ii) the independence model, (iii) the dialogue model, and (iv) the integration model (others, e.g. Barbour [7] and Peacocke [37] propose similar models with different names). Furthermore, it will take a look at the specific perspectives of some religions.

3.1 The incompatibility model   Ⓢ ⚡ Ⓡ

▸ *Science and religion are fundamentally incompatible. Either there is only religion or only science.*

There is not just one incompatibility model, some of them favor scientific, others favor religious views. Yet they all view the rational approach of science as incompatible with a divine explanation and thus represent an extreme case of the science-religion-relationship.

In this document the incompatibility models are separated into two groups: (i) models in favor of science, and (ii) models in favor of religion. All of the presented models have been or are heavily criticized from the other side, but their popularity has declined sharply since their peak in the 19th century. Nowadays, a more nuanced view (as discussed with the other models) is generally favored [20, 29].

Favouring science • Some modern scientists (e.g. the aforementioned Stephen Hawking or the still alive Richard Dawkins) support science based-models that require no religion to suffice. Some, like Richard Dawkins or Peter William Atkins,⟨9⟩ are even openly hostile and say that [16]: "[religion] subverts science and saps the intellect".

All of those scientists are part of a view named *scientific materialism*⟨10⟩ which accepts the material world as the only existing reality and denies the existence of any god or a higher world. Another view, *scientific imperialism*⟨11⟩ is a little less dismissive and accepts the existences of supernatural experiences. Although, they are mainly used as a gap-filler and any supernatural event is to be analyzed and explained

with scientific methods sooner or later [30] (similar to the view of positivism).

Favouring religion • The already mentioned Creationists (Section 2) regard religion as the only true perspective and belief their sacred texts (like the holy bible) word-by-word [25].

They are part of a view called *religious fundamentalism*, which is most prominent in the United States of America. An a little bit less strict interpretation is named *intelligent design*. It regards the world as a creation made by a divine and intelligent creator, a god. Supported by a lot of strict believing Muslims, it rejects Darwin's theory of evolution and regards it as incompatible with the Koran [17].

In addition to religious fundamentalism, there is another view (which has now become rather out of date): *Church authority*. This can be found, for example, in the cases of Galileo Galilei and Charles Darwin (Section 2) whose findings were subordinated to the opinion of the Vatican.

In particular, in contrast to scientific materialism, there is an idealistic perspective *Idealism*, in which reality is based only on human perception and exists only as some kind of spirit.⟨12⟩ See Subsection 4.1 for another view on the matter.

3.2 The independence model   Ⓢ⟳⟲Ⓡ

▸ *Science and religion are two different perspectives. They complement each other, but cannot be united (in a direct way).*

Similar to the category mistake,⟨13⟩ independence models (also named coexistence models) view science and religion as two independent languages that can not be translated into each other (easily). While the *Science-Language* describes the "real" material world, the *Religion-Language* describes the transcendental reality.

One of the best-known representatives of this view is Albert Einstein who famously said [19, p. 605 ff.]: "Science without religion is lame, religion without science is blind". Arnold Benz shares this view and proclaims that science and religion differ in their definition of reality (objective measurements vs. experiences) and meet only at certain points, for example in the amazement and ethics.⟨14⟩

The independence model is a rather modern view and supported by the National Academy of Sciences.⟨15⟩ Furthermore, it is backed by some religious people as well, e.g. Archbishop John Habgood calling science descriptive and religion prescriptive [24]. This view is further developed by the rabbi Menachem Mendel Schneerson, who states that science, because of its arbitrary axioms, is incapable of refuting the absolute truth of the Torah.⟨16⟩ This view will be analyzed further with the dialogue model coming next.

⟨8⟩ https://dailydot.com ✦ superintelligence   (Jan 23, 2021)
⟨9⟩ https://winteryknight.com/tag/peter-atkins/   (Jan 24, 2021)
⟨10⟩ https://sciencemeetsreligion.org/ ✦ materialism   (archived, Jan 24, 2021)
⟨11⟩ http://empireclubfoundation.com ✦ 2359   (archived, Jan 24, 2021)

⟨12⟩ https://www.britannica.com/topic/idealism   (Jan 31, 2021)
⟨13⟩ https://plato.stanford.edu/entries/category-mistakes/   (Jan 24, 2021)
⟨14⟩ https://uzh.ch ✦ awards-2011   (Jan 24, 2021)
⟨15⟩ https://nationalacademies.org ✦ evolution   (Jan 24, 2021)
⟨16⟩ https://chabad.org ✦ 66593   (Jan 24, 2021)

3.3 The dialogue model ⓢ ◇ ⓡ

▸ *Science and religion overlap in their questions. Their findings must be weighed against each other.*

As a kind of compromise, dialogue models view science and religion as two overlapping fields which use different perspectives to find common and enriched results. Yet, in the beginning, those models were only sparsely represented in favor of the other variants. The modern view is rooted in the works of Ian Barbour: "Myths, models, and paradigms: A comparative study in science and religion" [5], that re-raised the interest of several groups and focuses on ethical questions.

The foundations of today's ethics can be found in many ways in religions that convey ethical values and guidelines through their texts and traditions. Therefore, there are a lot of religious perspectives that capture the value of people and their role in creation, discussions about nuclear engineering, genetic engineering, and psychological experiments exceeding the scope of this document (cf. [6, 41]).

Beyond ethical issues, the dialogue models have some problems and often require a differentiated approach: The *Church authority*-concept (cf. Subsection 3.1) has shown severe problems when either side restricts the other one (especially if they do not even allow a dialogue). On the other hand, there are a lot of religious Nobel Prize winners [46] and scientists, arguing for such a dialog, fully accepting scientific views like the evolution theory.⟨17⟩

3.4 The integration model ⓢ ←→ ⓡ

▸ *Science and religion do not contradict each other. Their statements contribute to the same truth.*

From a standpoint of complex interactions, integrations models try to acknowledge mutual influences of different areas (including science and religion). They do not just say that scientific and religious views may coexist, they emphasize them being free of any contradictions. Perceived inconsistencies are therefore merely the consequence of a wrong or incomplete understanding. According to Ian G. Barbour, integration models are the "most promising option" (of the four models presented) [8, p. 2].

There are a lot of views classified as integration models (and new ones appear all the time). As a small overview, three different views are briefly highlighted below: (i) a scientific interpretation of the Koran, (ii) the process philosophy, and (iii) the evolution theology.

Koran interpretation • Already around the 12th century, the theologian al-Ghazālī⟨18⟩ located all knowledge (at the time) in the Koran. He assumed that the knowledge contained in the Koran only had to be understood and thus it strengthened his belief in its divine origin. His teachings were continued, for example, by Jalal al-Din al-Suyuti [2] in the 15th century,

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⟨17⟩ https://ncse.ngo/ ✦ religion   (Jan 24, 2021)
⟨18⟩ With full name: Abū Hāmid Muhammad ibn Muhammad al-Ghazālī.

who further strengthened the point of "all sciences" being located in the Koran.

With the 19th century, the perspective experienced a real boom, especially with Ṭanṭāwī Jawhari's 26 volume commentary on the Koran [27] (although it was harshly criticized for interpreting far too freely [17, p. 48]). To this day, new scientific discoveries are traced back to statements in the Koran [17].

Process philosophy • Alfred North Witehead and later his student Charles Hartshorne developed the process philosophy (later: process theology) by redefining the concept of reality. Instead of atoms, the reality is constructed from constant change and god is represented through creativity and order in ever-changing situations. With this, they explain (any) God's intervention in this world by creating order in which the emerging individuals can then develop [52].

Evolution theology • While the creation story in Genesis⟨19⟩ seems to contradict Charles Darwin's theory of evolution if taken literally, some integration models argue for them being contradiction-free. Therefore the sequence proclaimed by Genesis: light → plants → animals → humans, is nothing more than an abstract representation (or according to the theories: verification) of Charles Darwin's theory of evolution.

Other variants, such as Pierre Teilhard de Chardin's theology of evolution, consider the evolution to be far from complete, striving towards a "point omega" that enables the unification of science and religion (the reality of the world and the reality of a god [48]), which would be al-Ghazālī's idea.

3.5 Religious views

Up until now, the major focus lied in particular on Christianity (e.g. with the "Creationists"). Nevertheless, there are – of course – a large number of other religions, some of which deal (very) differently with the topic of science or higher beings. Therefore, this segment will briefly explain potential differences with two other religions: (i) Hinduism, as it is said to be the oldest religion [31, p. 732], and (ii) Buddhism, as it does not share the same conception of a god [42].

However, it is difficult to talk about concepts of faith without raising any conflict: every individual may hold his or her *own* concept of what belief or what a god is, and they are not meant to be attacked or generalized by this brief examination.

Hinduism • In contrast to Christianity, Hinduism has been more open to scientific discoveries,⟨20⟩ some texts are even said to contain references supporting or underlining multiple major scientific discoveries (e.g. Einstein's Theory of Relativity).⟨21⟩ This is mostly due to the fact that a lot of scientific advancements in Indian history are strongly intertwined with their religion [36].

⟨19⟩ http://vatican.va ✦ genesis   (archived, Mar 14, 2021)
⟨20⟩ https://www.hinduismnet.com/hinduism_science.htm   (Jan 31, 2021)
⟨21⟩ https://huffpost.com/ ✦ hinduism   (Feb 24, 2021)

Buddhism • Especially Buddhism and Science are considered to be compatible in an extraordinary way [54]. Buddhist concepts encourage an impartial investigation of the workings of nature and most of their schools have been open to scientific discoveries [33]. Furthermore, Buddhist practices like meditation are studied via brain-scanning and other technologies and produce invaluable insights into psychological states.⟨22⟩

4 Consciousness

When talking about science, religion, and the ways they interact, there are many areas where they clash and raise conflicts to be settled: genetic engineering, nuclear science, psychological studies, and more.

A lot of those topics have been discussed extensively [6, 38, 12], this section aims to address the concept of consciousness and artificial consciousness in particular [10, 11]. Hence, the mind-body problem which deals with the role of consciousness is presented first. Afterwards, this section examines the current state of research in those fields.

4.1 The Mind-Body Problem

The mind-body problem groups many theories concerning the relationship between the mind (with its thoughts and creativity) and the body (producing stimuli). One of those theories was already mentioned in Section 2 with Plato and Aristotle: Dualism. Yet, other theories are supporting Monism, a way of viewing consciousness and mind as one and not as two different entities – they will be discussed as well.

The following paragraphs are accompanied by small illustrations using a "B" as short for *Body* and a "M" as short for *Mind*,⟨23⟩ sketching the relationship.

Cartesian Dualism • Many dualistic views have been discussed by a lot of philosophers in the history of humankind (e.g. Plato and Aristotle). They all represent roughly the same concept found in cartesian dualism, a doctrine formulated by René Descartes [32]. Accordingly, body and mind are two different and independently existing entities that causally interact with each other. For Descartes there is an immaterial substance ("res cogitans") capable of thinking and a material substance ("rex extensa") incapable of thinking but responsible for physical processes.⟨24⟩

Physicalism • One monistic view on the mind-body problem is physicalism, stating that everything that exists is physical [47]. In consequence, the mind with all of its creativity is just the result of all the physical substance constructing the brain without anything "higher" at play. In fact, physicalism goes beyond the scope of the mind-body problem,⟨25⟩ comparable to scientific materialism [14] (cf. Subsection 3.1).

Idealism • Another monistic view is idealism which has been mentioned along the incompatibility models favoring religion in Subsection 3.1. Idealistic perspectives consider "reality" as indistinguishable from human perception. Thus, everything that "exists" only does so in the mind.⟨26⟩ Yet, there are a lot of different variants.⟨27⟩

Neutral Monism • There is not "the one" neutral monism. The term itself groups all theories which consider another fundamental nature to be responsible for the mind and the body (e.g. Ernst Mach considered this to be the combination of elements). Baruch Spinoza and David Hume are viewed as the originators of neutral monism [43], but their neutrality is sometimes criticized.⟨28⟩

4.2 The view of Information Technology

While most of the presented theories focus on philosophical aspects, there are more theories which assess the mind-body problem. Psychology, in particular social psychology, pursues the concept of embodiment [34] with a cognitivistic approach: the mind needs the body to exist, yet all those stimuli generated by the body are processed

Figure 2: Cognitivistic information processing.

as a whole and therefore not directly mapped to corresponding brain functions (see Figure 2).
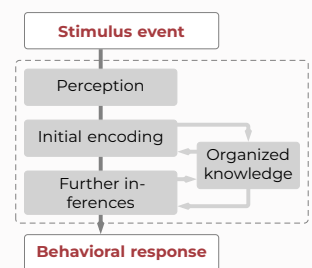
With the advent of information technology and neural networks, research on artificial consciousness began. If it would be possible to create consciousness solely through a programmed machine, this would not just favor physicalism but it would also undermine prominent religious views of consciousness as being something higher.

But what exactly is consciousness and what are the minimum requirements (e.g. for a machine) to be considered conscious?

Consciousness & Turing • Alan Turing (Section 2) formulated his famous Turing test (originally named "imitation game"):⟨29⟩ a human asks questions using only a keyboard and a monitor interfacing with two unknown partners. One of those partners is a human, while the other one is a machine. If the asking human is unable to determine who is who (machine or human), the machine should be considered to be "equal to the human".

Yet, the test is heavily criticized for testing the concept of consciousness since basic heuristic principles may be enough (and may already have been enough⟨30⟩) to fool a human into thinking that he (or she) talks to another one [28].

⟨22⟩ https://bbc.com ✦ meditation   (Jan 31, 2021)
⟨23⟩ Inspired by: en.wikipedia.org ✦ Dualism-vs-Monoism.png   (Feb 24, 2021)
⟨24⟩ https://iep.utm.edu/descmind/   (archived, Jan 31, 2021)
⟨25⟩ https://plato.stanford.edu/entries/physicalism/   (Jan 31, 2021)

⟨26⟩ https://qcc.cuny.edu ✦ Idealism   (Feb 24, 2021)
⟨27⟩ https://plato.stanford.edu/entries/idealism/   (Feb 24, 2021)
⟨28⟩ See 4., https://plato.stanford.edu/entries/neutral-monism/   (Feb 24, 2021)
⟨29⟩ https://www1.wdr.de/wissen/technik/turing-test-100.html   (Mar 14, 2021)
⟨30⟩ https://heise.de ✦ eugene   (Mar 14, 2021)

Consciousness today • As the awareness of internal or external existence is highly subjective, there is no simple way of checking if a machine is *really* self-conscious. Besides the Turing test, there are a countless number of other tests. They may all fail though, as any introspective or conscious sounding sentence can be the result of external programming or a machine which has been trained to say it. While this might sound strange, it may be the same with humans: Solipsism⟨31⟩ considers any other consciousness apart from the one of oneself to be unprovable.

Nevertheless, Baars's work [4] should not go unmentioned as he lists a very convincing set of functions that have to be met to at least consider the possibility of artificial consciousness.

Artificial approaches • The Turing test may have been beaten already,^see ⟨30⟩ yet there is no widely accepted self-conscious program as of today (and maybe, there never will be one [35, p. 231]). However, there are some promising approaches. . .

BabyX by Soul Machines is their first prototype that simulates an infant. By using neural networks, BabyX can evolve during real-time face-to-face interactions in a very compelling way [44].

Sophia is an adult android which has been granted citizenship in Saudi Arabia (in October 2017) and received an United Nation title just one month later.⟨32⟩ While Sophia appears to be "alive", such statements are heavily criticized.⟨33⟩

Besides those and countless other examples, some modern approaches try to use quantum computing (cf. [45]). In "Artificial intelligence: consciousness and conscience", Meissner gives a very well written deeper dive into the topic and presents other aspects of consciousness and difficulties in recreating them [35].

5 Discussion

Disclaimer • This section is heavily influenced by my opinion and does not try to convey "the ultimate truth". As already mentioned in Subsection 3.5, every individual may hold his or her *own* concept of what belief or a god is. I neither intend nor want to attack anyone who has a different attitude or even strongly disagrees with my take on the topic.

In four steps, I will try to give a brief overview of my thoughts.

5.1 The Unknown

No matter how long I have thought about the relationship between science and religion and discussed it with others, it all reduces to one fact: we do not know. Science is (at least as of yet) unable to explain everything and no religion as of date was able to objectively prove the existence of anything supernatural.

Without any ultimate truth, the debate will probably be everlasting. However, scientific research has undoubtedly produced a lot of valuable insights and a lot of once-unthinkable things are mundane today. And while I am certainly in favor of scientific research (since I study information technology), the scientifically graspable just might be a snow globe.

5.2 The Snow Globe

The "Snow Globe" is a perspective that I have created during countless walks and in discussions with many fellow students. It is probably most easily explained by the analogy from which the model arouse: the game Minecraft.⟨34⟩

The Origin • Minecraft is a sandbox game created by Markus Persson ("Notch") where the player(s) can interact with a world consisting of blocks. While the basic rules of the game are fairly simple, they offer a lot of freedom, allowing to build functional computers and flying machines within the game. Still, even today new techniques are discovered (with methods comparable to modern science) and used effectively.⟨35⟩

While *we* know that Minecraft was programmed and that we do exist "outside of the game", taking the perspective of an in-game character might represent the same situation as we are in, in our "reality". I will coin those two states as *out-game* (our reality) and *in-game* (the "Minecraft reality"). No matter how much research we would invest in-game, we would not know anything about the out-game world.

This perspective differs from that of the "The Matrix"-Trilogy⟨36⟩ because the in-game state is not the same as the out-game state in terms of its rules. It further differs from Abbott's "Flatland" [1] because the out-game state *created* the in-game state (furthermore, in Abbot's story they do casually interact with each other).

The Snow Globe • The name "Snow Globe" merely originated from the fact that the interaction between out- and in-game could very well be uni-directional. The inhabitants of snow-globe-world might see the snowfall, up and down, left and right, they might be able to discover *a* gravity (which might turn its direction with the snowfall), . . . yet they would be incapable of predicting the way the snow will fall as the out-game human might shake the snow globe and be interrupted by a sneeze/situational factors incomprehensible for the snow globe inhabitants.

Classification • I have created this model before I knew about all of the theories presented in Section 3. Mapping religion as the belief of the snow globe inhabitants in "us" or at least something higher than snow-globe-world, this model could be categorized as an independence (Subsection 3.2) or an

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⟨31⟩ https://www.britannica.com/topic/solipsism   (Mar 14, 2021)
⟨32⟩ https://asia-pacific.undp.org ⇐ sophia-un   (Mar 14, 2021)
⟨33⟩ https://theverge.com ⇐ sophia-critique   (Mar 14, 2021)

⟨34⟩ Although this works with basically any sandbox game, I have chosen to stay with the game the idea originated from.
⟨35⟩ Of course, some of those discoveries merely stem from the fact that the game still receives updates, yet a lot of them hold for older versions.
⟨36⟩ https://www.imdb.com/title/tt0133093/   (Mar 17, 2021)

integration (Subsection 3.4) model as the out-game rules influence the in-game ones (e.g. gravity). I will reinforce this model in Subsection 5.4.

5.3 The Extremists

Any intention may rot when the desire to enforce it blossoms in a one-dimensional and extremist perspective. And while utopia (by definition) sounds great, everyone may perceive it differently...

> Die Freiheit des Einzelnen endet dort, wo die Freiheit des Anderen beginnt.
> One's freedom ends where the freedom of another begins. (probably Immanuel Kant)

Therefore, I do not like views such as the Church authority (see Subsection 3.1) enforcing their truth as the only one, verifiably suppressing advancements and destroying existing knowledge.

Of course, this is neither limited to the relationship between science and religion,[37] nor is this limited to oppression from a religious side. As already mentioned in Subsection 5.1: we do not know.

5.4 The Golden middle

For myself, I ruled out the incompatibility model. Not just for the reasons mentioned before but for the main reason that it seems ignorant to ignore a perspective (no matter which side you are on) that you can not definitely *prove* to be false. With the other models, it is a little bit more difficult.

I do not believe in the dialogue model. While some kind of dialogue is definitely of use in the most prominent topic of ethics, I do not think that this holds for any other topic. The religious "discoveries" and phenomena are different from scientific ones. This might be due to the current lack of understanding in the human psyche, but if so, I think this does not support the dialogue model as it would either mean (a) a contradict free physical description of religious belief (supporting the integration model), or (b) another hint for the inexplicability of those events by scientific standards (supporting the independence model).

With this argument and the "Snow Globe", already discussed in Subsection 5.2, I tend to support the independence or integration model: even if we can create something that appears to be artificial consciousness, consciousness as we know it might just be another artifact of "our" reality.

I tend to the independence side: currently, it just seems far more plausible that we are not able to see out of our snow-globe-reality. While ethics were in fact primarily shaped by religion (at least in the beginning), I would argue for them being merely a side effect of human evolution and therefore not solely part of the religious side.

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[37] Yet, scientific advancements are as much a part of modern societies as religions have been just a few centuries ago.

6 Conclusion

With Subsection 5.1 it may seem blunt to end with "we do not know, but I think..." but this is (at least in my opinion) exactly what makes this topic so interesting. While it should be clear that one side restricting the other is not beneficial, different approaches like Levine's "explanatory gap"[38] show, that there are way more possible perspectives on this topic.

Furthermore, we may *do* know, sometime in the future. The advancements in information technology make a "The Matrix"-scenario more and more plausible. With artificial consciousness, we may be able to at least get further insights and thus further clues about the interplay of science and religion.

Yet, let's assume, that we really do live in a snow globe. If so, we will only ever be able to discover this, if we do not create one of our own. Ethics and the resulting boundaries are important; there is no question about that (albeit the ethic-discussion exceeds the scope of this document). Nevertheless, if we do not search for boundaries, we will never find them – and currently, we have not reached our limits.

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