

Science and Religion in the Modern West

Silke Gülder

In early sociological debates, science was regarded as the primary driving force behind secularisation. Over the course of subsequent decades, multiple alternative theories on the causes behind and processes of secularisation were developed, and the relationship between science and religion ceased to be the focus.

Recently, there has been renewed academic interest in this topic for two reasons. Firstly, the influence of evangelical churches is growing in many countries, resulting in polarised conflicts between so-called 'evolutionists' and 'creationists'. Secondly, there is new uncertainty about what science is, what a scientific fact is, and what the difference between scientific and non-scientific knowledge might be.

This article sheds light on the historical roots of debates on the relationship between science and religion by looking at two underlying perspectives: the conflict thesis and the differentiation thesis. Different as they are, both perspectives assume that science and religion are two separate and clearly distinguishable fields. The sociology of science and the science and technology studies call into question this exclusiveness of science and scientific work. Therefore, these concepts are discussed here with regard to their underlying ideas of the relationship between science and religion. Finally, the conclusion provides a suggestion for conceptualising the relationship between science and religion without dichotomising the two fields.

The Conflict Thesis

The earliest and most prominent proponent of the conflict thesis was Auguste Comte, whose 'law of three stages' posits that both individuals and humanity as a whole necessarily develop through a sequence of three stages: the theological, metaphysical, and, finally, the

Comte's positivism

positive stage.¹ While in the theological and metaphysical stages people need to refer to metaphysics to explain the world, the positive stage is characterised by the ‘positive method’ that supersedes metaphysics. This method would be exclusively focused on phenomena that can be observed in the physical world, as Comte put it:

Of this science it is even more true than of any of the preceding sciences, that its real character cannot be understood without explaining its exact relation in all general features with the art corresponding to it.²

Comte’s philosophy was also a political programme. His aim was to lead humanity from the early metaphysics-oriented stages into the positive stage. Religion was to be replaced by positive science. Science was not only a method to explain the world but also a lifestyle philosophy: “The primary object then of Positivism is twofold: to generalize our scientific conceptions, and to systematize the art of social life.”³ In his later work, Comte identified himself as a founder of a secular religion, describing positivism as a “religion of humanity”, with “temples of humanity” being established in several countries.

Positivist “religion of humanity”

Not all supporters of positivism accepted this idea of a secular religion. John Stuart Mill, for example, who was an enthusiastic follower of Comte, strictly separated between the ‘good’ early Comte and his later writings on the ‘religion of humanity’.⁴ However, the key ideas of the positivist philosophy were extremely popular, and thereafter, anyone wanting to be considered a serious scientist, had to follow positivist ideas and distance themselves from all traditional religious ideas and organisations.

Scientists had to distance from religion

The conflict between science and religion became a narrative in the history of science. In this narrative, the so-called Scientific Revolution between 1500 and 1700 was identified as a turning point when science liberated itself from religion. In 1873, the philosopher and scientist John William Draper published his widely anticipated book *History of the Conflict between Religion and Science*.⁵ Examining the

1 Auguste Comte, *A general view of positivism* (London: Routledge, 1907 [1848]).

2 Comte, *A general view of positivism*, 2.

3 Comte 3.

4 John Stuart Mill, *Auguste Comte and Positivism* (Milan: CreateSpace Independent Publishing Platform, 2016 [1865]).

5 John William Draper, *History of the conflict between religion and science* (Teddington: The Echo Library, 2007 [1873]).

Scientific Revolution, Draper states substantial reasons for the inevitable conflict between science and religion: “faith is in its nature unchangeable, stationary; science is in its nature progressive”. Following this line of thinking, anyone supporting progress must, by definition, stand in opposition to religion. The popularising of this distinction has had a long-lasting impact. When sociology was in its infancy in the early 20th century, religiously motivated researchers were actively excluded from the scientific community to ensure the discipline was established as a serious science.⁶

Draper: Religion contrasts progress

In more recent work on the history of science, a number of contributions have called the conflict thesis into question. Most prominently, Brooke⁷ offers an alternative view of the relationship between science and religion in the era of the Scientific Revolution. Not taking an explicit position on the conflict thesis, he describes a history of interaction between science and religion, rather than considering them as two wholly separate entities. He highlights that famous scientists of the time, such as Robert Boyle and Isaac Newton, explicitly sought to prove the existence of God with their scientific work.

Brooke: Interaction of science and religion

With this position, Brooke is in line with contemporary historical work, which acknowledges that historical perspectives are always shaped by their historical environments.⁸ The specific environment of the positivist era thus led to a specific construction of the history of the Scientific Revolution as a story of conflict.⁹

Eric Voegelin¹⁰ developed a more philosophical theory regarding the rise of secular religions like scientism. In his view, this rise was due to the ‘pathologies of modernity’ and modernity’s neglecting of any outer-worldly transcendence, of anything that is beyond human control. With the Enlightenment, all outer-worldly transcendence,

Voegelin: Secular religions result from modern relocating of the absolute to the inner world

6 M. S. Evans, “Defining the public, defining sociology: Hybrid science – public relations and boundary-work in early American sociology,” *Public Understanding of Science* 18, no. 1 (2008).

7 John Hedley Brooke, *Science and Religion. Some Historical Perspectives* (New York: Cambridge University Press, 1991).

8 See also the various contributions in Thomas Dixon, Geoffrey Cantor, and Stephen Pumfrey, eds. *Science and Religion. New Historical Perspectives*. (Cambridge: Cambridge University Press, 2010).

9 Margaret J. Osler, “Religion and the changing historiography of the Scientific Revolution,” In *Science and Religion. New Historical Perspectives*, ed. Thomas Dixon, Geoffrey Cantor, and Stephen Pumfrey (Cambridge: Cambridge University Press, 2010).

10 Eric Voegelin, *Die politischen Religionen*, ed. Peter J. Opitz (München: Fink, 1993 [1938]).

the absolute, the very reason for everything existing was relocated into the inner world. This process, Voegelin states, led to totalitarian ideologies, like racism or Marxism, as well as to scientism.

The conflict thesis and Comte's philosophy remained influential throughout the 20th century and are still influential today. One more recent example would be the scientism ordered by the state in the former GDR with the purpose of supplanting all religious belief. Politically, the systematic implementation of a scientific worldview in the education system at all levels aimed at diminishing the influence of Christian churches in GDR society.¹¹

Contemporary form
of secular religion:
New Atheism

Today, the conflict thesis is present again within a contemporary form of secular religion: New Atheism. The main protagonists of this movement are Richard Dawkins, Daniel C. Dennett, Sam Harris, and Christopher Hitchens (who passed away in 2011). Over the last 15 years, they have published numerous books, and developed a public profile, with the explicit goal of liberating their readers from religion and teaching them the ideas of science. Their books have been translated into many languages and they have received broad public attention. The main focus of this movement, though, is their opposition to the evangelical creationist worldview which is most powerful in the United States of America.¹²

There is good reason to describe New Atheism as a secular religion, comparable to Comte's religion of humanity: The authors campaign for their ideas with the zeal of missionaries. Richard Dawkins, for example, publishes 'Paragraphs of the Week' on his website¹³ in the manner of a founder of a religion. There is also an Atheist Church, attended by atheists every Sunday to sing and enjoy a shared sense of community.¹⁴

11 Thomas Schmidt-Lux, *Wissenschaft als Religion: Szientismus im ostdeutschen Säkularisierungsprozess* (Würzburg: Ergon, 2008).

12 Tom Kaden, *Kreationismus und Antikreationismus in den Vereinigten Staaten. Eine konfliktsociologische Untersuchung* (Wiesbaden: Harrassowitz, 2014); Tom Kaden and Thomas Schmidt-Lux. "Scientism and atheism then and now. The role of science in the Monist and New Atheist writings," *Culture and Religion* 17, no. 1 (2016).

13 See www.richarddawkins.net. In fact, these 'Paragraphs of the Week' do not appear every week, but rather irregularly, and since February 2018, there does not seem to have been any new entries.

14 See, for example: <https://www.economist.com/erasmus/2018/05/16/the-elusive-phenomenon-of-churches-without-god>, The official website of American Atheists (www.atheists.org) lists more than 170 local affiliates. For an empirical investiga-

In sum, the conflict thesis has its roots in the philosophy of Comte's positivism and is still present in debates and worldviews today. However, the conflict thesis has more supporters in the Anglo-American regions than in Western Europe, where the differentiation thesis is more popular.

Conflict thesis more prominent in Anglo-American regions than in Western Europe

The Differentiation Thesis

It must be noted, however, that the self-conscious tension of religion is greatest and most principled where religion faces the sphere of intellectual knowledge.¹⁵

This is how Max Weber characterises the relationship between science and religion in his famous *Intermediate Reflections*. In this work, he identifies inevitable tensions between religions of salvation and the world in the course of rationalisation processes. In fact, he argues that religions of salvation themselves follow a logic of rationalisation, but that this logic conflicts with that of the ideal-typically distinguished political, aesthetic, erotic, and intellectual spheres of value.

Weber: tensions between religion and rationalisation

Weber identifies the conflict between the religious and intellectual spheres of value (*Wertsphären*) as the most significant tension, as

Conflict between religious and intellectual spheres of value

[in] principle, the empirical as well as the mathematically oriented view of the world develops refutations of every intellectual approach which in any way asks for a 'meaning' of inner-worldly occurrences.¹⁶

This 'meaning', however, is fundamentally important for every religion of salvation – the explicit function of such religions is to explain the meaning and significance of everything that is in the world.

In stark contrast to Comte, however, Weber does not assume or promote the decline of religion. Instead, he describes different possible reactions of religious leaders in response to these tensions. One reaction is to prove their own dogmas to be true in the sense of positive scientific methods. Another, more important, reaction is to emphasise the principal differences between the two ways of knowing: While science is able to explain existence, religion is able to explain

tion of atheist communities, see Stephen LeDrew, *The evolution of atheism. The politics of a modern movement* (New York: Oxford University Press, 2016).

15 Max Weber, *Essays in Sociology*, transl., ed., and introd. H. H. Gerth and C. Wright Mills (New York: Oxford University Press, 1946 [1920]), 350.

16 Weber, *Essays in Sociology*, 351.

the meaning and purpose of this existence. Tensions between science and religion remain inevitable, however, with his typification of different spheres of values, Weber does not conceptualise these tensions as temporary, but as an enduring and stable part of modern societies.

Weber: Different functions of religion and science

To summarise Weber's view, religion and science perform different functions in the modern world. As long as they limit themselves to these functions – meaning that religions would not try to develop holistic concepts about existence, and science would not develop moral imperatives – a peaceful coexistence would be possible.¹⁷ Weber's argument can be seen as an early precursor of the differentiation thesis, which in the following decades became the most powerful concept for analysing modernisation in general and secularisation in particular.

Malinowski: Religion, magic and science as anthropological constants

Only a few years after Weber's writings, Bronislaw Malinowski developed an idea of functional differences between science, religion, and magic.¹⁸ Malinowski had a different methodological perspective to Weber; he was a pioneer of anthropology and ethnographic methods. From his participant observation in the Trobriand Islands, he concluded: "There are no peoples however primitive without religion and magic. Nor are there, it must be added at once, any savage races lacking either in the scientific attitude or in science, though this lack has been frequently attributed to them".¹⁹ This conclusion was in strict opposition to the positivist idea of a linear and self-evident evolution from religion to science in modern societies. Science, Malinowski stated, was not a new phenomenon of the modern period, but had been part of all cultures throughout history. Religion and magic had also maintained a ubiquitous presence, coexisting with science. Therefore, there was no reason to assume that scientific progress should necessarily result in a decline of religion.

Science does not cause decline of religion

From his observations, Malinowski determined the distinction between the functions of magic, science, and religion: According to him, both scientific knowledge and magic provide solutions to

17 Friedrich H. Tenbruck, "Religion und Kultur – die Religion im Maelstrom der Reflexion," in "Religion und Kultur," ed. Jörg Bergmann, Alois Hahn, and Thomas Luckmann, special issue 33 of *Kölner Zeitschrift für Soziologie und Sozialpsychologie* (1993).

18 Bronislaw Malinowski and Robert Redfield, *Magic, science, and religion* (Glencoe: The Free Press of Glencoe 1948).

19 Malinowski and Redfield, *Magic, science, and religion*, 17.

practical issues; science addresses that which is subject to human influence, whereas magic addresses that which lies beyond or outside of it. In contrast, religion is referred to in order to cope with fundamental individual or community crises in a moral way.

The concept of magic subsequently fell out of fashion in sociological research. The underlying idea of science and religion fulfilling different functions, however, as was initially developed by Max Weber and later investigated by Malinowski, became the key theoretical framework within which to interpret their relationship. Later works by Talcott Parsons²⁰ and Niklas Luhmann²¹ further develop the concept of functional differences, conceptualising science and religion as distinct subsystems that generate different benefits for societies.

Parsons and Luhmann further develop idea of functional differentiation

The differentiation thesis - supposing that secularisation does not cause the complete decline of religion but instead involves a partitioning of function such that religion's focus is restricted to creating sense of existence²² – ultimately became the consensus view. Western sociology accepted this thesis unchallenged for decades, with the effect that the relationship between science and religion was not subject to much sociological investigation. Later secularisation theorists suggested a number of other reasons for the assumed decline of religion, such as religious and social pluralisation and the resultant privatisation of religion,²³ competition on the market of worldviews,²⁴ or socio-structural developments such as individualisation and urbanisation.²⁵ The rise of modern science was considered only a minor factor within these theories.

In recent years there has been a re-opening of the debate about the relationship between science and religion, driven by reflections on the nature of scientific knowledge and knowledge production on a

20 Talcott Parsons, *The social system* (New York: Free Press of Glencoe, 1951).

21 Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt a. M.: Suhrkamp, 1992); Niklas Luhmann, *Die Religion der Gesellschaft* (Frankfurt a. M.: Suhrkamp, 2015 [2000]); Niklas Luhmann, *Funktion der Religion* (Frankfurt a. M.: Suhrkamp, 2016 [1982]).

22 Oliver Tschannen, "The Secularization Paradigm: A Systematization," *Journal for the Scientific Study of Religion* 30, no 3 (1991).

23 Thomas Luckmann, *Die Unsichtbare Religion* (Frankfurt a. M.: Suhrkamp, 1991); Peter L. Berger, *Der Zwang zur Häresie: Religion in der pluralistischen Gesellschaft* (Frankfurt a. M.: Suhrkamp, 2000 [1980]).

24 Berger, *Zwang zur Häresie*.

25 Steve Bruce, *Religion in Modern Britain* (Oxford: Oxford University Press, 1995).

micro level. Apart from the macro-sociological idea of differentiation, the question remains of the extent to which it is possible to clearly distinguish between scientific and religious knowledge, between knowing and believing. These questions will be discussed in the following, referring to work in the fields of sociology of science, and science and technology studies.

Sociology of Science, and Science and Technology Studies (STS)

Social embeddedness
of science

The aim of sociology of science, and that of science and technology studies (STS) is to emphasise and analyse the social embeddedness of science.²⁶ The founding of these fields, however, can only be understood against the backdrop of intense debates about the relationship between science and religion.

Sociology of science, as was particularly evident in its early stages of development as an academic field, has one clearly identifiable antagonist, that of positivism. Though support for Auguste Comte's more ideological version of pure positivism was decreasing, the members of the Vienna Circle²⁷ developed their theory of 'logical positivism' quite successfully. Their fundamental argument was that

26 For a detailed version of this section, see Silke Gülder, "From 'Science and Religion' to 'Transcendence in Science' or: What We Can Learn from the (History of) Science and Technology Studies," in *Science, Belief and Society: International Perspectives on Religion, Non-Religion and the Public Understanding of Science*, ed. Stephen H. Jones, Rebecca Catto, and Tom Kaden (Bristol: Policy Press, 2019).

27 The Vienna Circle was founded in 1924 by Moritz Schlick and met and worked until 1936. Famous members were, among others, Otto Neurath and Rudolf Carnap. In contrast to Comte, the members emphasised that there was a need for rationalising and verification, and that observation as such was not enough. In the early 20th century, interdisciplinary groups and circles were founded in many cities in order to promote the positivist idea. In Leipzig, for example, the psychologist Wilhelm Wundt, the geographer Friedrich Ratzel, the historian Karl Lamprecht, the physical chemist Wilhelm Ostwald, and the economist Karl Bücher met on a weekly basis at the so-called 'Positivisten-Kränzchen' (Katharina Neef, *Die Entstehung der Soziologie aus der Sozialreform: Eine Fachgeschichte* (Frankfurt a. M.: Campus, 2012), 78ff.; see also Roger Chickering, "Das Leipziger 'Positivisten-Kränzchen' um die Jahrhundertwende," in *Kultur und Kulturwissenschaften um 1900. II Idealismus und Positivismus*, ed. Rüdiger vom Bruch, Gangolf Hübinger, and Friedrich Wilhelm Graf (Stuttgart: Franz Steiner Verlag, 1997)). For an introduction to the philosophy of positivism, see Ian Hacking, *Representing and Intervening. Introductory topics in the philosophy of natural science* (Cambridge: Cambridge University Press, 1983), 41ff.). On the Vienna Circle, see Friedrich Stadler, *The Vienna Circle: Studies in the Origins, Development, and Influence of Logical Empiricism* (Wien: Springer, 2001).

all scientific facts need to be rationalised on the basis of empirical observation. As with Comte's positivism, the Vienna Circle made a clear and fundamental distinction between any form of metaphysical belief or religious dogma on the one hand and scientific knowledge on the other.

Later work in philosophy of science questioned the assumption of the possibility of 'pure observation'. Karl Popper, who criticised the Vienna Circle for its overtly empiricist view, was one of the first authors to take into account the scientist's own perspective.²⁸ He stressed that scientists, before they make any observation, first refer to particular theories. Observation in Popper's view, thus, does not exist independent of researchers' perspective. However, Popper still emphasizes that scientific work is fundamentally based on logic and is thereby clearly distinct from all knowledge-making outside the realm of science.

In the 1930s, two books were published that called into question this idea of the exclusiveness of science in different ways: Robert K. Merton did so on a meso-level, Ludwik Fleck on a micro-level. Both authors deal intensively with the relationship between science and religion.

In his early work on *Science, Technology and Society in Early 17th-Century England*,²⁹ Merton emphasised the role of Puritanism in the rise of the so-called Scientific Revolution. The book is an empirical study on shifts in the vocational interests of intellectual elites. Focusing on the 17th century, he identifies an increasing interest in all aspects of science and a declining interest in religion. To explain this shift, Merton neither refers to the secularisation thesis nor describes science as the winner of a supposed conflict between science and religion. Instead, he argues that a value system particular to Puritanism led to the rise of interest in the sciences. Thus, similarly to Max Weber's thesis on the close connection between Protestantism and capitalism, Merton assumes a connection between Puritanism, particularly in England, and science. There are two aspects of the Puritan ethos that Merton assumes to be responsible for this connection. On the one hand, science was intended to praise God through discovering

Philosophy of science rejects possibility of "pure observation"

Merton and Fleck: Questioning the logical exclusiveness of science

28 Karl R. Popper, *The logic of scientific discovery* (New York: Basic Books, 1959 [1934]).

29 Robert K. Merton, *Science, Technology and Society in Seventeenth-Century England* (New York: Fertig, 1972 [1938]).

the “true Nature of the Works of God”. On the other hand, science may also concern itself with the “Comfort of Mankind”, and seek to solve practical worldly problems.

Merton, in this early – indeed, arguably the first – work in sociology of science, denies the idea of science’s search for cognition and truth being independent of any social environment. Instead, he stresses how deeply scientific work is impacted by the value systems of the individual scientists as well as by the organisations that form the institutional environment in which the research occurs. However, Merton’s theses remain at the organisational level of science: he focuses on the question of the motivations behind scientific work, in particular behind the choice of research focus. Once a particular topic is chosen, even Merton would describe scientific work as an exclusive enterprise, which can operate separately from any non-scientific force.

Ludwik Fleck’s book *Genesis and Development of a Scientific Fact*³⁰ goes beyond this idea: He states that the distinction between scientific and religious knowledge cannot be defined theoretically, and can only be investigated empirically. His main argument is that any cognition is collective in character. Against positivism and the Vienna Circle’s philosophy of science, Fleck calls into question the very idea of any individual cognition. For an individual to recognise anything, the individual always needs to build on an existing stock of knowledge. A community, which shares a particular stock of knowledge and a particular ‘thought style’, Fleck names a ‘thought collective’.

The defining characteristic of a thought collective is that it produces binding or compulsive truth claims. Fleck describes the role it has for an individual referring to Durkheim’s description of collective consciousness.³¹ The thought style is not accessible to the individual, but simply determines how they think. This, Fleck argues, is true of any thought style and, thus, also true for scientific reasoning. Communities in general, and the scientific community in particular, have the power to create dogma-like knowledge. Through collective reasoning, it can produce words that become magic, have a magical

30 Ludwik Fleck, *Genesis and development of a scientific fact* (Chicago: University of Chicago press, 1979).

31 Emile Durkheim, *The Division of Labour in Society* (Basingstoke: Palgrave Macmillan, 2013 [1893]), 31ff.

Merton: Impact of culture and individual value systems on scientific work

Fleck: Distinction between scientific and religious knowledge is not self-evident

Thought styles as scientific reasoning are pre-individual

power, as Fleck puts it. Thought styles always imply something implicit, unconscious or transcendent to the individual. Fleck illustrates this aspect with reference to the initiation into a thought style:

The initiation into any thought style, which also includes the introduction to science, is epistemologically analogous to the initiations we know from ethnology and the history of civilisation. Their effect is not merely formal. The Holy Ghost as it were descends upon the novice, who will now be able to see what has hitherto been invisible to him. Such is the result of the assimilation of a thought style.³²

With these arguments, Fleck was an early proponent of many ideas that are found in much later work by both Thomas Kuhn and Bruno Latour, as well as throughout the area of anthropological research in STS. However, in contrast to later work in the STS community, Fleck explicitly positions himself against the idea that there is a fundamental difference between scientific and religious knowledge.

Fleck argues for comparative empirical work to be done in order to illuminate different thought styles at different times and places. If we consider the work in STS over recent decades, we notice that his call for empirical investigation was widely heard and followed, with laboratory studies aiming to reconstruct interaction within the laboratory as an investigation of the underlying thought styles. With her focus on different ‘epistemic styles’ Knorr-Cetina³³, for example, compares different modes of interaction, or, in Fleck’s terms, different thought styles. We also find empirical analysis of different disciplines, such as the social sciences³⁴ or mathematics³⁵. However, most of today’s anthropological work in STS remains within the realm of science, and there appears to be little interest in undertaking comparative research contrasting thought styles in science, religion, or other thought collectives based on particular belief systems.

32 Fleck, *Genesis and development of a scientific fact*, 104.

33 Karin Knorr-Cetina, *Epistemic Cultures. How Sciences Makes Knowledge* (Cambridge: Harvard University Press, 1999).

34 Michèle Lamont, *Peer Evaluation in the Social Sciences and the Humanities Compared. The United States, the United Kingdom and France. Report prepared for the Council of Canada* (Harvard University: Cambridge, 2005), <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.529.4425&rep=rep1&type=pdf>.

35 Bettina Heintz, *Die Innenwelt der Mathematik. Zur Kultur und Praxis einer beweisenden Disziplin* (Wien: Springer, 2000).

Differentiation within the field of science has also meant that disciplines have separated into many subdisciplines. As a result of this specialisation of focus, the sociology of religion avoids consideration of science, and the same is true of the sociology of science and consideration of religion.

Outlook

The relationship between science and religion was one of the most important topics of dispute in the early years of sociological research. With the conflict thesis on the one hand, and the differentiation thesis on the other, two concepts were established early on, that retain their influence as an analytical framework to this day. The conflict thesis is more influential in the Anglo-American context and the differentiation thesis more in the Western European context. Both theses mainly argue from a macro-sociological perspective. The fields of sociology of science, and science and technology studies question the exclusiveness of scientific knowledge on a micro level. However, due to the disciplinary division of labour, there has been little work on the relationship between science and religion for many years. To renew the theoretical debate and empirical investigation, there is need for interdisciplinary collaborative research. One possible avenue for overcoming the disciplinary separation could be pursuing a research focus on *constructions of transcendence and unavailability*. Instead of assuming science and religion to be distinct spheres, the analysis here focuses on the question of how boundaries are constructed between something that is available and something that is not available.

Approaching religion
and science by research
on constructions of
transcendence and
unavailability

Starting from Schütz and Luckmann's concept of small, intermediate, and great transcendence,³⁶ the construction of transcendence can be investigated empirically. *Small transcendences* refer to that which is not currently perceivable for reasons of spatio-temporal limits. *Intermediate transcendences* describe that which is presumed to be fundamentally unavailable in another subject: No matter how well I can imagine it, I will never be able to completely grasp what another subject is feeling or thinking. *Great transcendences* are 'other realities' which are in principle unavailable to conscious access, for example the world of dreams. Such great transcendences, which are

36 Alfred Schütz and Thomas Luckmann, *The structures of the life-world* (Evanston: Northwestern University Press, 1973).

experienced in an inner-worldly manner, according to Schütz and Luckmann, can also form a sense of the world as a whole.

I recently drew on this concept of transcendence when investigating the work of stem cell researchers in Germany and the United States of America.³⁷ Unavailability in this field always has a double connotation: Something can be unavailable or transcendent for technical or practical reasons, and something can be unavailable for ethical reasons. In the particular cases I investigated, the researchers constructed their subject cells and animals as unavailable in the sense of intermediate transcendence. For most researchers, the cosmological idea of a species order remains unavailable in the sense of great transcendence. However, the study also identified culture-specific differences in those constructions.

Thus, the construction of transcendence and unavailability is fundamentally important in both science and religion, as well as in societies in general. Focusing on these constructions might help to develop new interdisciplinary perspectives on the relationship between science and religion.

37 Silke Gülker, “Transcendence in Stem Cell Research: A Research Perspective beyond the Science versus Religion Dichotomy,” in “Science and Religion: Revisiting a Complex Relationship,” ed. Fernanda Alfieri and Kärin Nickelsen, special issue, *Annali dell’Istituto storico italo-germanico in Trento* 43, 1 (2017); Silke Gülker, *Transzendenz in der Wissenschaft. Studien in der Stammzellforschung in Deutschland und in den USA* (Baden-Baden: Ergon, forthcoming 2019).

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