



# Creation and evolution: A relationship fraught with misunderstandings

**Author:**Martin Rothgangel<sup>1,2</sup> **Affiliations:**

<sup>1</sup>Evangelisch-Theologische Fakultät der Universität Wien (University of Vienna), Vienna, Austria

<sup>2</sup>Department Practical Theology, Faculty of Theology and Religion, University of Pretoria, South Africa

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**Corresponding author:**

Martin Rothgangel,  
incheolshin@hanmail.net

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The relationship between evolution and creation, both religiously and ideologically, continues to be a source of misunderstandings that occur at various levels and is further explored in this article. On the basis of empirical studies and theological considerations, the following four types of misunderstandings in the field of religious education are discussed: (1) 'Creation' as nature – an ethically motivated misunderstanding, (2) Genesis 1 as 'Creation Report' – a theologically conditioned misunderstanding, (3) 'Scientific Creation Report' versus Evolution – the Creationist misunderstanding and (4) Scientifically proven Theory of Evolution versus Creation – the Scientific misunderstanding. These types of misunderstanding might be well known to experts in the field of 'creation and evolution'. In the field of religious education, however, the harassing question remains as to why these misunderstandings are so widespread and resistant. For this reason, the last part of the articles asserts that empirical teaching and learning research is a religious educational desideratum in the face of these misunderstandings.

**Keywords:** Evolution; Creation; Misunderstanding; Religious Education; Creationism; Scientism.

## Introduction

On 24 November 1859, Charles Darwin published his book *The Origin of Species by Natural Selection*, which did not just changed the field of biology but also transformed the world view in a way hardly any other book has. In a highly simplified form, Darwin argues that the diversity of species did not exist from the beginning, but developed slowly through many intermediate steps and that this evolution ultimately results from the interplay of accidental mutation and regular selection. Many people perceived Darwin's theory of evolution as a threat, because it seemed to refute the biblical story of creation and to deprive humanity of his special position in nature. Soon the quintessence of Darwin's research was reduced to the catchy phrase that humanity had descended from the ape. When the wife of the English bishop of Worcester heard of Darwin's theory of evolution in the summer of 1860, she reacted to this news in a way that has become particularly anecdotal: 'My dear, descended from the apes! Let us hope it is not true, but if it is, let us pray that it will not become generally known'.

It remains to be seen whether this desire for prayer as such expresses a theological misunderstanding. At any rate, the prayer was not answered, on the contrary: Not unlike Luther's theses, Darwin's originally purely scientific theory spread at lightning speed. Very soon, a fierce dispute broke out between the advocates and opponents of 'Darwinism', as this theory was called soon after its publication. Darwin's theory was also transformed by some of his contemporaries into an ideology with different orientations (social Darwinism, evolutionism, developmental monism). Regardless of these ideological transformations, Darwin's theory has since received strong support from molecular biology. The hereditary leaps that Darwin himself could not yet explain can be described as changes in the structure of genes. Even though not all details of the theory of evolution have been clarified at present and it is by no means proven in every respect, there are good reasons why it is considered part of the solid stock of fundamental scientific knowledge that shapes our current view of the world. At the same time, the relationship between evolution and creation in both religious and ideological terms still represents a reliable source of misunderstandings that occur at various levels and which will be examined in more detail below.<sup>1</sup> The following considerations are often based on data from German-speaking countries. In this sense, readers from other international contexts might ask themselves whether and to what extent the following misunderstandings also occur in their region. The same applies to the theological argumentation in this article: This is also context-specific. Readers may, however, ask themselves how their context-specific theologies would argue with regard to the misunderstandings listed below.

1. Basic ideas of the following explanations can be found in Rothgangel (2009, 2018).

**Note:** HTS 75th Anniversary Maake Masango Dedication.

## 'Creation' as nature: An ethically motivated misunderstanding

In the field of religious education, it is to the credit of Guido Hunze's study (2007) to have emphasised how limited the understanding of creation as nature is. Based on his analysis of three selected textbooks: (1) Trutwin: 'Time of Joy' – 'Ways of Faith' – 'Signs of Hope'; (2) Hilger/Reil: 'Reli'; (3) Koretzki/Tammeus: 'Discovering – Understanding – Shaping Religion', he identified five problem areas (Hunze 2007:67–69). Firstly, creation is only an important point of reference in one of the three textbooks examined. Secondly, the meaning of the concept of creation is not explained in more detail, rather creation is spoken of as though the meaning of the term was self-evident. The third point is crucial to the present section, namely that in extreme cases the concept of creation is used synonymously with 'environment' or 'nature' in the ethical chapters of the textbooks. Fourthly, the relationship between the natural sciences and theology also plays a central role, which can lead to the impression that the biblical world views have been rendered obsolete by the scientific ones. Finally, Hunze notes that the question of creation is reflected in textbooks primarily from biblical–theological perspective and less systematically–theologically.

On the whole, the quintessence of the deficits described by Hunze can be seen in the fact that creation in the textbooks he examined is often used as a vague term or is reduced to the ethical as nature or environment and a systematic theological clarification of the term is necessary in order to avoid misunderstandings.

Hunze makes such a definition of creation above all with recourse to Jürgen Moltmann and states: summary that (Hunze 2007):

[C]reation is a *relational concept*, in which the mutual relations between God and the world and the creatures therein (especially humans) are expressed. To the extent that the community of creation referred to in this context is only realized in time when God enters into his creation, the concept of creation has a temporal structure: Creation takes place in the arch of tension between protology and eschatology, which are always related to each other. In the *Sabbath* this temporal structure experiences a condensation, in which the commemoration of the beginning and the anticipation of perfection meet. (p. 265)

In the context of such a theologically qualified concept of creation, the undoubtedly important ethical dimension of creation also acquires its appropriate meaning (Anselm 2012). Nevertheless, this theological definition also makes it clear that the appropriation of a fine-grained concept of creation is a demanding task even for pupils of secondary level II. This is exemplarily underlined by an experience of the author, which he had with teacher students (!) of Protestant religion at the University of Regensburg: All eight participants of a revision for systematic theology understood creation only in the sense of *creatio originans*, but not as *creatio continua*. In view of these theological challenges, it is also not surprising that the concept of creation in textbooks

can be theologically underdetermined and used in an incomplete way synonymously with nature or the environment, because in ecological questions one sees a meaning for the present and future for the pupils and can avoid complex theological contexts.

## Genesis 1 as 'Creation Report': A theologically conditioned misunderstanding

Even if the speech in Genesis 1,1ff. has been problematised as a creation report for quite some time, this language use can be found not only among pupils but also among religion teachers and in theological publications (Cf. Körner 2006:146; Link 2008:89). It seems to be fully justified by the fact that even leading Old Testament scholars can speak of the Creation Report (Gertz 2009; Westermann 1961). This diction is therefore used even if one is aware of the stylised and poetic character of Genesis 1,1–2,4a (Link 2008:88f.).

In doing so, those theologians perpetuate a misunderstanding, which they are not aware of and the implications of which they underestimate. If one considers further composites of 'report' – for example 'eyewitness report' or 'business report' – in everyday language, then it clearly emerges as a problem that the theological way of speaking about the creation report can give the impression that Genesis 1,1–2,4a is a factual report describing the origin of the world and of life. This results in an understanding of creation that is on the same level as the theory of evolution and is in conflict with it or can only be laboriously reconciled.

Belaying a more detailed discussion as to which genre is best suited for the two traditions of creation in Genesis 1,1ff, it seems advisable, at least from the point of view of religious education, to use a term to describe the literary genre that is generally comprehensible in the context of the everyday use of language. In order to avoid the misunderstanding that Genesis 1–2 is a report of fact, it is therefore necessary to make a point of using language carefully, for example, to describe Genesis 1,1–2,4a as 'creation poetry' or Genesis 1–2 as 'creation narratives'. Even the common way of speaking of 'creation history' or 'creation stories' is not necessarily problematic with regard to the everyday language use of history (e.g. history as a narrative of something past), but can also lead to misunderstandings (e.g. history in the historical sense).

In short, through a reflected use of the generic characterisations of Genesis 1,1ff., a direct conflict with the theory of evolution is avoided, at least in linguistic terms, by expressing with these terms the different approach to the world in comparison with the scientific one.

Although the above-mentioned point is of significance that should not be underestimated, the following statement by a student shows that there are further challenges for religious education lying ahead (Schuster 1984):

Then there is a lot of evidence for the theory of the origin of the earth that one can say that it wasn't like it says in the Bible, even if one interprets it figuratively. (T. 1196)

This quotation documents that the idea of Genesis 1,1ff. as a factual report is the prevailing notion ('it was not like in the Bible'), although there is also an awareness that the Bible does not need to be interpreted literally ('even if one interprets it figuratively').

Developmental psychological considerations are helpful, because they can awaken a understanding that the underlying problem of an appropriate determination of the relationship between creation and evolution can by no means be solved en passant in school lessons. In particular, the studies on thinking in complementarity show that it is precisely in this subject area that the test persons show a lower level of performance than in other subject areas. This means that in the topic 'Creation and Big Bang/Evolution', they act on a lower level of complementary thinking than usual and that scientific theory is often preferred by arguing that unlike the biblical understanding of creation it can be proven (Reich 1997:29–54).

Furthermore, in terms of James Fowler's theory of the development of faith, the second stage of the mythical-literal faith must be considered (Fowler 1989:87–91). According to him, it can be considered a 'normal' stage of development for children to read Genesis 1,1ff. as a literal report of development of the world and life. Children are by no means in a deficient state of faith, to be treated as a childish misunderstanding and overcome as quickly as possible. Here, too, the (religious) didactic consensus formula applies: 'Leave alone and encourage' (Bucher 1995:42). If, however, there is no religious didactic support, then young people themselves finally distance themselves from the biblical Creation Report, describing it as childlike and disproved by natural science. Especially against the background of these developmental psychological challenges, it is all the more important to avoid the misleading use of Genesis 1,1ff. as a 'Creation Report'.

Although the developmental psychological considerations show that the understanding of the Creation Report is also biographically conditioned, the problem becomes even more acute if this linguistic usage is supported theologically.

## 'Scientific Creation Report' versus evolution: The creationist misunderstanding

The creationist form of misunderstanding represents a specific continuation of the misunderstanding of Genesis 1 as a 'Creation Report'. This creationist impasse has consequences, especially because it is linked to numerous political conflicts from the past to the present, some of which play out in school. The origins of creationism can be found within the framework of US-American fundamentalism. This movement, which came into being at

the end of the 19th century, saw Darwinism as an example of the denial of the biblical texts of creation literally revealed by God and as a consequence the degradation of humanity created in the image of God to a descendant from apes. In the so-called monkey trial which took place in 1925 in Dayton Tennessee and was a big media spectacle, Thomas Scopes was sentenced to a fine because he had taught the doctrine of evolution at a high school. However, in this process creationism was ridiculed so publicly that as a result it was considered backward and fundamentalists stopped their socio-political activities.

The resurgence of creationism should seem all the more astonishing. The movement has been growing in the United States for some time and increasingly so in Europe. The reasons for this public revival of creationist thinking are multifaceted: The Institute for Creation Research (ICR) near San Diego may play an important role in emphasising the scientific claim of creationism. Moreover, in recent times, in contrast to the older creationist debates, the discussion has shifted, for example, in the context of the debate on intelligent design to certain special scientific questions that can hardly be understood and examined by laypersons (Hemminger 2007). Finally, an interreligious dimension has recently emerged, as the representatives of the current Turkish government want to remove the theory of evolution from school teaching materials because it is questionable and allegedly too complex for pupils (Die Zeit online 22 June 2017). This is a development that has indirect effects on Islamic faith communities in German-speaking countries (Die Presse online 21 July 2017).

To many peoples surprise, the debate about creationism and intelligent design was hotly debated in the German-speaking world in the context of the Darwin Year 2009 (EKD 2008; Höger 2010; Nipkow 2008; Schweitzer 2008). In resorting to the above-mentioned developmental psychological considerations, however, not every person in favour of a literal understanding of Genesis 1,1ff. should simply be described as creationist. Rather, it can be stated more precisely, especially with regard to the context of school, that people have a creationist attitude if, unlike children, they possess the cognitive preconditions to think beyond a mythical-literal kind of faith, but regard Genesis 1,1ff. as a literal report standing in direct competition to scientific theories of world and life development and try to prove them pseudo-scientifically. Basically, they are making a dual mistake: It is theologically inadequate to consider Genesis 1,1ff. a factual report of the origin of the world and life and scientifically inadequate to expect a certain result from the outset of a scientific investigation. Any deviation from the biblical 'Creation Report' as God's word is considered untrue.

If one wants to deal more closely with this creationist misunderstanding, then the problematic consequences of a literal understanding of Scripture must be dealt with more broadly in religious instruction and especially against the background of a hermeneutical as well as a historically critical interpretation of Genesis 1,1ff., namely that the

authors of the biblical texts expressed their faith in God as Creator against the backdrop of the state of knowledge about 2500 years ago.

Nevertheless, certain pitfalls of a historical–critical view of Genesis 1,1ff. must also be taken into consideration.

A historical–critical treatment of Genesis 1,1 can also lead to the difficulty of understanding the ‘nasty trench’, as the following quote from a pupil shows (Rothgangel 2004):

Most of the things we’ve learned were written in exile and so these things today would no longer apply at all or would no longer have any real meaning except as stories to compete with those of the Babylonians. What does he still want with it today? The Babylonians are dead anyway. Extinct. Gone. (p. 283)

The biblical understanding of creation is thus obsolete for this student, because it no longer seems to fulfil any present function. Once again it becomes apparent here why the religious instructional treatment of the relationship between creation and evolution is so demanding and how quickly the absence or over accentuation of one or the other facet can lead to misunderstandings among students.

## Scientifically proven theory of evolution versus creation: The scientific misunderstanding

Considering the extent to which the present world is shaped by science and technology (Hunze 2007:135–178), it is hardly surprising that scientific statements such as ‘it has been proved that ...’ are already considered an argument in discussions (Weiß 2016). Even if reliable empirical studies are lacking, there are clear indications in biology and physics didactic studies that science teaching can at least indirectly induce or reinforce scientific attitudes among students. One reason for this seems to be that, on the one hand, a large number of biological and physical laws and theories are dealt with, but, on the other hand, their scope and limits are hardly reflected from a scientific–theoretical perspective (Körner 2006:224–231). In the latter respect, a recent empirical study also states (Astley & Francis 2010):

Our data lend support to the recommendations made by others that the school curriculum should incorporate topics on science and religion, including some study of the nature of science, and should reflect scholarly interpretations of the nature of the biblical creation stories. (p. 196)

The negative effect of scientism on religious faith has been empirically proven for some time. As early as the 1980s, representative studies on scientism in Scotland and Kenya showed that belief in science is a prime negative factor with regard to the attitude towards Christianity and secondly that faith in science among young people increases with age (Fulljames & Francis 1988; Gibson 1989).<sup>2</sup> While 17% of the 11-year-olds agreed with the item ‘Science has refuted the Bible’, this number stood at 29% of the 16-year-olds. It is

<sup>2</sup>Both empirical studies applied the same item scale.

noteworthy that in comparison, the increase in the item ‘Science has refuted the biblical creation narrative’ was even clearer: from 20% of 11-year-olds to 49% of 16-year-olds. In own pilot studies (Rothgangel 2004), it has also been consistently shown that students in particular view the biblical creation stories as having been refuted by natural sciences even more frequently than the Bible in general. This is a decisive point of conflict and a fundamental difficulty of understanding for pupils.

In this sense, the representative study by Feige and Gennerich (2008) for the Western German context also determines factor analytically that the semantics of ‘coincidence’ and ‘big bang’ on the one hand and of ‘God’s creation’ on the other hand do not seem to be compatible (p. 105). Furthermore, in no other question area does this study document a comparably high standard deviation with regard to the mean value, which is ‘an indication of the contentiousness among the young people/young adults surveyed’ (p. 102).

The fact that scientific attitudes among pupils are a widespread phenomenon in the German context is documented by the biological didactic study by Konnemann et al. (2016); 21.8% of the 1672 pupils surveyed expressed scientific attitudes, while ‘only’ 4% had a creationist attitude (18 pupils). Thus, a quarter of these students together represented the scientific or creationist variant of the conflict model.

It is expressly stated that this challenge is equally applicable to biology and religious education. Lammert’s (2012) biology didactic study also provides evidence for the following statement:

The results show that the acceptance of evolution by pupils at lower secondary level is particularly influenced by their attitude towards science. Test persons who accept scientific ways of thinking and working also show a higher acceptance of evolution. On the other hand, the faith of the respondents has a negative effect on their attitude towards evolution. Especially very pious students show a low acceptance of evolution. (p. 136)

Irrespective of the question that the understanding of ‘faith’ documented in the items is by no means unproblematic, findings such as these present both a challenge in terms of biological didactics and religious education (Gamballa & Schweitzer 2010:151).

## Teaching and learning research as religious educational desideratum in view of those misunderstandings

The above-mentioned misunderstandings are by no means a new insight of religious education research, but rather – without claiming completeness – a compilation of serious and fundamental misunderstandings and difficulties of understanding which, from the author’s point of view, exist in the context of religious education in relation to evolution and creation. From a theoretical point of view, for some time now there have been well-founded hypotheses as to how this complex challenge could be dealt with in religious education (Angel 1988; Dieterich 1990; Höger 2008; Hoffmann 2014).

For example, basic ideas of the so-called independence model of theology and natural science can be cited against the creationist as well as against the scientific misunderstanding, because it shows emphatically that the statements on evolution on the one hand and creation on the other hand are on different levels (Rothgangel 1999).

Self-critically, however, it should be noted that this theoretically founded assertion has still not been sufficiently substantiated by empirical study: What effect does a relevant letter from Karl Barth (1975:291f.) to his grandniece have on creationist or scientific pupils, for example, in which he explains the difference between natural science and theology using the example of vacuum cleaner and a musical organ? Which media and teaching scenarios are useful? (Göföinger 2014). Thus, the desideratum of empirical teaching research exists, so that after '1000 hours of religious education' at least fundamental misunderstandings regarding the relationship between creation and evolution are cleared up.

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M.R. is sole author of article.

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## References

- Angel, H.-F., 1988, *Naturwissenschaft und Technik im Religionsunterricht*, Peter Lang, Frankfurt am Main.
- Anselm, R., 2012, 'Schöpfung als Deutung der Lebenswirklichkeit', in K. Schmid (ed.), *Schöpfung*, pp. 225–294, Mohr Siebeck, Tübingen.
- Astley, F. & Francis L.J., 2010, 'Promoting positive attitudes towards science and religion among sixth-form pupils: Dealing with scientism and creationism', *British Journal of Religious Education* 32(3), 189–200. <https://doi.org/10.1080/01416200.2010.498604>
- Barth, K., 1975, *Gesamtausgabe*, V/4. Briefe 1961–1968, in J. Fangmeier & H. Stoevesandt (eds.), TVZ, Zürich.
- Bucher, A., 1995, 'Religionspädagogik und empirische Entwicklungspsychologie', in H.-G. Ziebertz & W. Simon (eds.), *Bilanz der Religionspädagogik*, pp. 28–46, Patmos, Düsseldorf.
- Dieterich, V.-J., 1990, *Naturwissenschaftlich-technische Welt und Natur im Religionsunterricht. Eine Untersuchung von Materialien zum Religionsunterricht in der Weimarer Republik und in der Bundesrepublik Deutschland (1918–1985)*, Peter Lang, Frankfurt a.M.
- EKD, 2008, *Weltenstehung, Evolutionstheorie und Schöpfungsglaube in der Schule. Eine Orientierungshilfe des Rates der Evangelischen Kirche in Deutschland*, EKD Texte 94, Hannover.
- Feige, A. & Gennerich, C., 2008, *Lebensorientierungen Jugendlicher: Alltagsethik, Moral und Religion in der Wahrnehmung von Berufsschülerinnen und -schülern in Deutschland*, Waxmann, Münster.
- Fowler, J., 1989, *Glaubensentwicklung. Perspektiven für Seelsorge und kirchliche Bildungsarbeit*, Kaiser, München.
- Fulljames, P. & Francis, L.J., 1988, 'The influence of creationism and scientism on attitudes towards Christianity among Kenyan secondary school students', *Educational Studies* 14, 77–96. <https://doi.org/10.1080/0305569880140108>
- Gamballa, S. & Schweitzer, F., 2010, 'Was können Biologieunterricht und Religionsunterricht voneinander erwarten?', in B. Janowski, F. Schweitzer & C. Schwöbel (eds.), *Schöpfungsglaube vor der Herausforderung des Kreationismus*, pp. 172–191, Vandenhoeck & Ruprecht, Neukirchen-Vluyn.
- Gertz, J.C., 2009, 'Antibabylonische Polemik im priesterlichen Schöpfungsbericht?', *ZTHK* 106, 137–155. <https://doi.org/10.1080/0305569880140108>
- Gibson, H.M., 1989, 'Attitudes to religion and science among school children aged 11 to 16 years in a Scottish city', *JET* 2(H. 1), 5–26. <https://doi.org/10.1163/157092589X00013>
- Göföinger, C., 2014, *Die Rezeption der Schöpfungserzählung nach Gen 1-2,4a bei Grundschulern. Eine fächerübergreifende Interventionsstudie*, Peter Lang, Frankfurt a.M.
- Hemminger, H., 2007, *Mit der Bibel gegen die Evolution. Kreationismus und 'intelligentes Design' kritisch betrachtet* (EZW-Texte 195), EZW, Berlin.
- Höger, C., 2008, *Abschied vom Schöpfergott. Welterklärungen von Abiturientinnen und Abiturienten in qualitativ-empirisch religionspädagogischer analyse*, LIT, Berlin.
- Höger, C., 2010, 'Schöpfungsglaube und Evolutionstheorie: Zum Kreationismus in den Köpfen von Schülerinnen und Schülern', in: Institut für Religionspädagogik der Erzdiözese Freiburg (ed.): *Themen im Religionsunterricht*, Freiburg i. Br.
- Hoffmann, J., 2014, *Das Wirken Gottes innerhalb eines evolutiven Weltbildes: Systematische Theologie, Naturwissenschaften und Religionspädagogik im Dialog*, Dissertation, viewed 6 May 2019, from [https://www.theo-web.de/zeitschrift/online-reihe/010\\_hoffmann.pdf](https://www.theo-web.de/zeitschrift/online-reihe/010_hoffmann.pdf).
- Hunze, G., 2007, *Die Entdeckung der Welt als Schöpfung. Religiöses Lernen in naturwissenschaftlich geprägten Lebenswelten* (Praktische Theologie heute, Band 84), Kohlhammer, Stuttgart.
- 'Islamische Glaubensgemeinschaft gegen Evolutionstheorie', Die Presse online, viewed 8 November 2017, from <https://diepresse.com/home/panorama/wien/5256065/Islamische-Glaubensgemeinschaft-gegen-Evolutionstheorie>.
- Körner, B., 2006, *Schöpfung und Evolution. Religionspädagogische Untersuchungen zum Biologieunterricht an kirchlichen Gymnasien in Ostdeutschland*, Evangelische Verlagsanstalt, Leipzig.
- Konnemann, C., Asshoff, R. & Hammann, M., 2006, 'Insights into the diversity of attitudes concerning evolution and creation: A multidimensional approach', *Science Education* 100, Nr. 4, 673–705. <https://doi.org/10.1002/sce.21226>
- Lammert, N., 2012, *Akzeptanz, Vorstellungen und Wissen von Schülerinnen und Schülern der Sekundarstufe I zu Evolution und Wissenschaft*, viewed 10 November 2017, from [https://eldorado.tu-dortmund.de/bitstream/2003/29476/1/Dissertation\\_Lammert.pdf](https://eldorado.tu-dortmund.de/bitstream/2003/29476/1/Dissertation_Lammert.pdf).
- Link, Chr., 2008, 'Christlicher Schöpfungsglaube und naturwissenschaftliches Weltverständnis. Wie kann man Kreationismus argumentativ begegnen?', *EvTh* 68, 84–98. <https://doi.org/10.14315/evth-2008-0204>
- Löber, Chr. & Rothgangel, M., 2008, 'Naturwissenschaft und Theologie. Eine Unterrichtssequenz zu ihrem Verhältnis in Planung und analyse', *entwurf H.*, 4(2008), 46–55.
- Nipkow, K.E., 2008, 'Schöpfungsglaube, Kreationismus und Naturwissenschaft: Voraussetzungen für das Gespräch des Religionsunterrichts mit naturwissenschaftlichen Fächern', *Theo-Web. Zeitschrift für Religionspädagogik* 7(H. 1), 28–47.
- Reich, K.H., 1997, 'Erkennen, Argumentieren und Urteilen mittels verschiedener Denkformen. Möglichkeiten für einen bewussteren Umgang mit ihnen', *Bildungsforschung und Bildungspraxis* 19, 29–54.
- Rothgangel, M., 1999, *Naturwissenschaft und Theologie. Ein umstrittenes Verhältnis im Horizont religionspädagogischer Überlegungen* (Arbeiten zur Religionspädagogik, Bd. 16), Vandenhoeck & Ruprecht, Göttingen.
- Rothgangel, M., 2004, 'Die Bibel im Religionsunterricht – beobachtet und analysiert', in V. Elsenbast R. Lachmann & R. Schelander (eds.), *Die Bibel als Buch der Bildung* (Forum Theologie und Pädagogik, Band 12), FS G. Adam, pp. 279–291, LIT, Wien.
- Rothgangel, M., 2009, 'Zwischen „Schöpfungsbericht“ und „Evolutionismus“. Verstehensschwierigkeiten von SchülerInnen', *ZPT* 61, 375–382. <https://doi.org/10.1515/zpt-2009-0409>
- Rothgangel, M., 2018, 'Schöpfung und Evolution – eine Beziehung voller Missverständnisse', *JRP* 34(2018), 123–134. <https://doi.org/10.13109/9783666702594.123>
- Schuster, R. (ed.), 1984, *Was sie glauben. Texte von Jugendlichen*, J.F. Steinkopf, Stuttgart.
- Schweitzer, F., 2008, 'Kreationismus und Intelligent Design im Religionsunterricht? Neue Herausforderungen zum Thema Schöpfungsglaube', in: ders., *Elementarisierung und Kompetenz. Wie Schülerinnen und Schüler von „gutem Religionsunterricht“ profitieren*, pp. 52–61, Neukirchener, Neukirchen-Vluyn.

Steck, O.H., 1981, *Der Schöpfungsbericht der Priesterschrift: Studien zur literarkritischen und überlieferungsgeschichtlichen Problematik von Genesis 1,1 - 2,4a*, 2. Aufl., Vandenhoeck & Ruprecht, Göttingen.

'Türke streicht die Evolution aus dem Lehrplan', Die Zeit online, viewed 6 November 2018, from <https://www.zeit.de/gesellschaft/schule/2017-06/evolutionstheorie-tuerkei-schulen-gestrichen-lehrplaene>.

Weiß, T., 2016, *Fachspezifische und fachübergreifende Argumentationen am Beispiel Schöpfung und Evolution: theoretische Grundlagen - empirische Analysen - jugendtheologische Konsequenzen*, Vandenhoeck & Ruprecht, Göttingen.

Westermann, C., 1961, *Der Schöpfungsbericht vom Anfang der Bibel: Vom rechten Umgang mit der Bibel* (Calwer Hefte 30), Calwer, Stuttgart.