

Dear reader

This is an author produced version of an article published in *Zygon - Journal of religion & science*. This article has been peer-reviewed and copy-edited but does not include the final publisher's layout including the journal pagination.

Citation for the published article:

Evers, Dirk

"Religion and Science in Germany"

Zygon, 2015, Vol. 50, Issue 2: 503-533

URL: <https://doi.org/10.1111/zygo.12172>

Access to the published version may require subscription.
Published with permission from: Wiley-Blackwell, Oxford

Thank you for supporting Green Open Access.

Your IxTheo team

Religion and Science in Germany

By Dirk Evers

Abstract. During the last fifty years, the dialogue between science and religion in Germany has gained momentum. This essay briefly describes the academic setting in Germany with denominational theology at state universities and explains the development of secularization in reunified Germany. Twenty-five years after reunification, East Germany is one of the most secular societies in the world, and religion is seen as a strange relic. This poses challenges to the interaction between science and religion in both parts of Germany. The essay then presents important institutions and contributors to the interaction between science and religion in Germany over the past fifty years, emphasizing the importance of private institutes at the intersection of the academy with society, churches, and ethical challenges.

Keywords: Germany; Jürgen Moltmann; Wolfhart Pannenberg; secularism; theology and science; Michael Welker

Introduction

In this essay, I am going to portray the dialogue between religion and science in Germany in the last fifty years. A preliminary remark seems appropriate because it affects the terminology of the subject this essay is dealing with. The English word 'science', which is derived from the Latin 'scientia', originally meant "an organized body of knowledge, or an intellectual discipline" (McGrath 2001, 24). The German term 'Wissenschaft', as the usual and most natural translation of science, has kept this general denotation while in modern English the meaning of 'science' has shifted to 'natural science' ('Naturwissenschaft' in German). The more general term 'Wissenschaft' in the German context applies not only to physics, chemistry, biology etc., but also comprises the humanities like social, cultural and linguistic studies. Thus 'science' (Wissenschaft) is usually not envisioned as a monolithic entity but rather as a plurality of sciences and other fields of academic study. To avoid misunderstanding I will use the term in the modern English meaning, referring to the natural sciences only. For the German 'wissenschaftlich' I will use 'academic'.

In the following, I will first describe the German academic and religious setting as it has developed in the last five decades. I will then give an overview of the science-religion-theology debate in Germany presenting institutions, individuals and publications in a more or less chronological order.

The German Situation

The Academic Setting in Germany

The German language is the most widely spoken first language in the European Union with around 100 Million speakers. Given that in Eastern and Northern Europe traditionally there still is an – albeit rapidly declining – significant number of academics who are able to read, write and speak German, and that among citizens of the EU-15 countries, 32% say they can converse in German, it must be taken into account that there is an international, German speaking academic scene which, especially for the humanities, in Germany, Austria and parts of Switzerland provides the stage for academic discourse. Apart from post-graduate studies in the natural sciences, more or less all higher learning in Germany is done in German. In the humanities, and in philosophy and in theology especially, the most important references come from the German tradition, and more or less all standard textbooks are in German. From Kant to Habermas and from Luther to Pannenberg, German philosophical and theological debate has long been a rather closed universe of discourse of its own. As a consequence, the theological discussions in Germany, Austria and the German parts of Switzerland are part of a

single German discourse, and there is a constant exchange of academic personnel as well as students among these countries. The *Academic Society for Theology* (*Wissenschaftliche Gesellschaft für Theologie*, see <http://www.wgth.de>), to which most German speaking theologians with a qualification for full professorship (Habilitation) belong and which organises regular conventions in Germany, Austria, Switzerland and sometimes other parts of Eastern Central Europe, is an important forum for academic encounter and exchange.

In recent decades, this self-sufficiency of the German humanities has changed severely, most prominently in cultural sciences, partly in philosophy, and maybe least in theology. German academic theology is able to maintain relative independence because theological faculties are responsible for education for ministers in German churches and for teachers of religious instruction in public schools, and their existence is secured by church-state treaties (see below). However, the requirements of international exchange and for broader, internationally visible research, the decline of knowledge of German as a foreign language, the fewer and fewer numbers of German works translated into English and vice versa, the international competition for students, researchers and teaching staff, have all forced German researchers to take English literature more and more into account, and to publish in English more often. Although most scholars in the humanities still teach and write in German and refer mostly to German sources, and thus work somewhat detached from English-speaking academia, the movement towards English as an important means of discourse for research and the urge to relate to developments outside the German context has grown significantly. It is indicative of this development that most German faculties in the humanities have recently altered their language requirements with regard to PhD theses, which now can be written in English and other main European languages, and not only in German.

However, these developments have also widened the gap between academic education as vocational training and academic research. Most students of theology seek to qualify for ministry or as a teacher of religious education in public schools and therefore study theology as a vocational training and not with a research perspective. Thus the traditional German understanding of academic theology as the acquisition of an intellectual and existential attitude (in Barthian terms: "Theologische Existenz: theological existence") has changed towards more pragmatic and more differentiated educational paths for students as well as towards more international, interdisciplinary and at the same time more specialised fields of research, which are implemented in close collaboration with non-theological disciplines. However, these interdisciplinary research networks are usually limited to cultural, social or philosophical studies in a broad sense, which take a methodological lead and refrain from posing and answering questions of religious or theological validity. Interdisciplinary research across the divide between natural sciences (Naturwissenschaften) and humanities plus cultural studies (Geistes- und Kulturwissenschaften) is rare.

The Religious Situation in Germany

Churches, Religious Communities and State

After the First World War, state and church were separated in Germany. However, to this very day officially registered church bodies operate as *Körperschaft des öffentlichen Rechts* (corporations of public as opposed to private law) and their relation to the state is regulated by church-state treaties (concordats). Nowadays, also non-religious humanist organisations like the *Humanistische Verband Deutschlands* have been granted the same status which includes certain tax benefits. Part of the church-state relationship in Germany is the right for religious communities to collect their member-

ship fees by means of 'church tax.' The taxation authorities of the state collect the fees from declared members of the respective religious communities on the basis of their income tax (usually 8–9% of the income tax) and forward this money to the religious body. In return, the state authorities keep about 1% of that money as service fee. Some smaller communities (for example the Jewish Community of Berlin) choose to collect taxes themselves to save these fees, while others like Muslim communities and most of the Free Churches (Baptist, Methodist etc.) do not participate in the church tax system at all, but collect their fees and donations as private associations. German citizens, who do not declare themselves to be members of an officially registered religious community, pay no such tax.

The German constitution guarantees denominational religious education in public schools (mostly Protestant and Catholic, but also Orthodox, Jewish, Buddhist (only in Berlin) and lately Islamic) with Ethics or Philosophy as obligatory alternatives if parents or after the age of fourteen children themselves want to opt out. In the cases of the main Protestant Churches and Roman Catholic dioceses, the concordats usually also guarantee one or more theological faculties at state universities to educate teachers for religious education at public schools, to provide academic studies for prospective clergy and for others interested in denominational theology. Up to this day, all theological faculties in Germany are denominational faculties, either Protestant or Catholic. Since most parts of Germany were denominational homogeneous in the past, at most universities there is only one theological faculty representing the main denomination in that area. However, there are some universities where a faculty of the other denomination was founded later and incorporated into the university (for example: Tübingen has had a Protestant faculty since the Reformation, and a faculty of Catholic theology since 1817; Münster has the largest Catholic faculty in Europe, which has existed since the end of the 18th century, and has had a faculty of Protestant theology since 1914).

Recently Islamic religious education was introduced in public schools, and in 2010 and 2011 the Federal Ministry of Education and Research established *Institutes for Islamic Theology* at the universities of Münster/Osnabrück, Tübingen, Frankfurt a.M./Gießen and Erlangen-Nürnberg. These Centres have not yet gained faculty status and are either affiliated to other faculties (like cultural studies) or function as faculty-independent centres of the university. Negotiations have taken place and are still going on between Muslim communities and the local ministries of education to develop school curricula and to work towards acceptance of graduate students of Islamic theology as clergy (Imams) with Muslim congregations of different denominations. The round table for coordination of these studies includes experts from administration, politics, religious studies and different Muslim communities including Shiites, Sunnis, Alevi, members of the Ahmadiyya Muslim Community and others.

The Centres for Islamic Theology and other institutions have recently founded a Postgraduate Program in Islamic Theology (see www.graduiertenkolleg-islamische-theologie.de) which seeks to provide qualifications for young researchers and to build a network of research in Islamic Theology. At a growing number of German universities one can find departments/faculties of Protestant and/or Catholic theology, Islamic theology and religious studies side by side. In addition there are departments of Jewish Studies at a number of German universities (see http://de.wikipedia.org/wiki/Jüdische_Studien for a list). With this significant diversification in the field of denominational theology the German government has followed the recommendations of the *German Council of Science and Humanities* (Wissenschaftsrat), a national body of academics and figures in public life which gives advice to the German Federal Government and the State Governments about the structure and development of higher education and research. In 2010 it was asked

to give “Recommendations on the Advancement of Theologies and Sciences concerned with Religions [religionsbezogene Wissenschaften] at German Universities” (available in English: http://www.wissenschaftsrat.de/download/archiv/9678-10_engl.pdf). In its report the council demands “necessary structural adjustments concerning the Christian theologies,” which should intensify “their participation in trans-faculty, interdisciplinary research projects”, and “the expansion of other disciplines, especially including the establishment of Islamic Studies at universities,” which should be implemented *within* the state-run higher education system. “This will be the best way to ensure the scientific quality of research and teaching, intensify the discourse with other forms of scientific world-interpretation, and provide a robust, theological basis for the inter-religious dialog.” A pluralisation of faith-bound theologies alongside with other, secular studies of religion with the requirement of close interdisciplinary research and dialogue seems to be the path for higher education in religion for Germany. It can be anticipated that all aspects of the the science-religion dialogue will sooner or later become an interdisciplinary and interreligious issue in this context.

While the dialogue between science and theology as such has a natural ‘setting in life’ (‘Sitz im Leben’) at theological faculties, it becomes an *object* of historical, cultural and social research within the perspective of religious studies which would usually refrain from actively participating in it. Faculties or departments of religious studies usually exist side by side with denominational theological faculties. They may analyse the interactions between religions and sciences and the transformations of their relationship from the perspective of cultural studies, but would not take a stand in actual debates and would not enter into an intellectual argument about the validity of certain beliefs and positions. Of course, many scholars in religious studies have a personal relationship to religion, but this can vary from open opposition to religion to different forms of more or less strong commitment towards a certain faith or religion.

Secularization in Germany

Like other countries in the West, German society has been deeply transformed through a process of secularization which was different in both, West and East Germany. In 1950, 50.6% of the West German population belonged to the Protestant Church, 46.8% were Catholics, and only 3.6% had no religious affiliation (data from Federal Statistical Office). From the beginning of the 1960s this slowly began to change. In 1987, only three years before reunification, the two major churches still had a significant rate of membership (41.6% Protestants, 42.9% Catholics) while 11.4% were with no religious affiliation, 2.7% Muslims, and 1.2% other denominations (Orthodox and others). East Germany (the German Democratic Republic, GDR), on the other hand, with its Communist history, developed into the part of Europe where membership of a church or any religious institution is the lowest. In 1950 in Communist East Germany 91.5% of the population still belonged to the church (mainly Protestant), but at the end of the Communist era that figure had gone down to less than 25%, and today it is even less. At present, 25 year after the reunification of West and East Germany in 1990, apart from Muslims (about 4%) and other religions, roughly a third of the German population has no religious affiliation, another third belongs to the Protestant church, and the other third is Catholic. According to the Bertelsmann Religion Monitor 2013, 68.5% of the East German population considered themselves to be non-denominational (konfessionslos, belonging to no religion), with only 17% doing so in the West. In East Germany, 45% believed in no greater or divine power compared to only 27% in the West. 23% of East Germans declare themselves to be outspoken atheists. This is reflected in terms of spirituality. Nearly 80% of the East German population do not understand themselves as spiritual and do not relate to religious beliefs.

According to Gert Pickel, professor for Sociology of Religion and Church at Leipzig University, the religious situation in Germany appears to be twofold. There is a strong, but not extraordinary process of secularization going on in West Germany which leads to a reduced membership of the churches, accompanied by a loss of religious traditions and knowledge, hand in hand with religious individualisation and pluralisation. Pickel calls it religious pluralism with a large spectrum of secular options. One could also apply Charles Taylor's idea of modern secularism as characterized by a multiplication of options, religious, spiritual and secular. In East Germany, however, a culture of non-religion is established and now deeply rooted, where life without religion or spirituality is the normal way of life. Not that people have lost religion: they never had one, having hardly come across it and seeming to have no need for it. Rather than forced secularization, Pickel describes this as a religiously disinterested culture of secularity which he calls a culture of post-denominationalism (*Kultur der Konfessionslosigkeit*). While in the West a plurality of religious and non-religious convictions has developed within a secular setting, in the East being non-religious has become the normal case. This is illustrated by Monika Wohlrab-Sahr, professor for Sociology of Culture at Leipzig University, who during qualitative interviews in East Germany regarding religious convictions ended the interviews with the question whether the person interviewed would prefer to consider him- or herself as Christian or atheist. She received well-defined answers from older people, but many youngsters replied: "Neither, just normal (*Weder noch, normal halt*)" (Wohlrab-Sahr 2002, 11). And in contrast to many Western forms of atheism, this habitual non-religiousness is not aggressive or missionary. It appears as self-evident, but goes hand in hand with puzzlement about, and a certain mistrust of, religions, including Christianity, but mainly Islam. Apparently, and this is a growing consensus among German sociologists of religion, there is no general need for religion, religious convictions, spirituality and rituals within large strands of the East German population. However, Pickel also distinguishes between different types of people with no religious denomination (he has proposed as many as seven different categories, cf. Pickel 2011, 63) and relates them to different motives and biographies of post-denominationalism and non-religiousness. The "nonreligious" must not be treated as a monolithic group, and the usefulness of prevalent terms such as "atheist", "agnostic" or "spiritual-but-not-religious", which divide the nonreligious along belief-based lines, must also be questioned.

Central to all types is that the burden of proof is seen as lying with religious interpretations and that popular science and a certain concept of rationality have replaced religious views on life and reality. While an unquestioned, self-evident, all-pervasive secular attitude prevails, religion is seen as strange, embarrassing and unscientific, although many, if not most, values and ethical norms are shared between church members and non-church members. Interestingly, in West Germany the difference in ethical attitudes between religious and non-religious groups is higher than in East Germany, where an explicitly non-religious majority clings to core values such as solidarity, family life and social cohesion. A certain general rationalism combined with what is considered a scientific world-view promotes a valuing of science, evidence and rationality, and sees science in stark contrast to faith, belief and religion, which are all seen as unscientific, induced by early childhood prejudices and maintained by institutions in collaboration with politics. This is also used to understand their own, non-religious world-view as a result of the progress of science, of society and the overcoming of prejudices.

All this poses new challenges to the science-religion dialogue because the social construction of religion involves the construction of false religion and non-religion, and vice-versa: the predominance of an alleged scientific world-view constructs religion as an outsider position. There are opposing tendencies and interests, at times highlighting the difference and at times blurring the difference,

e.g. with regard to morality and values, claiming that even the non-religious are religious (or at least spiritual) in a sense, or that a society without religion is bound to disintegrate. The categories of religion vs. non-religion, or religion vs. science, are part of different political constructivist practices. The science and religion dialogue has already shifted from traditional apologetics to more open, explorative forms. Religion has to be explained, and distorted or misinformed and mistrusted views on religion have to be countered. It is by no means clear or self-evident what we are talking about when we talk about science and religion. That poses questions to the field. Is the divide between religion and science, seen as more or less mono-thematic categories, at all helpful in a secular or post-secular society? Who is maintaining this divide, and who is constructing those categories and for what reasons? Is religion (singular!) a helpful category at all?

And it must be taken into account that these concepts are usually integrated into metanarratives, which either understand modernity as the release from ill-founded prejudices or as a moral decline losing ethical orientation while being imprisoned within an iron cage of rationality and efficiency. These metanarratives tell the story of modernity as a story of gain or loss, and of enduring emancipatory or reactionary forces, and they vary significantly from society to society. I am convinced that the science and religion dialogue in a religious/non-religious secular setting, such as German society, has to question the very categories it tries to bring into mutual exchange. And I am afraid that German liberal academic theology with a strong focus on religion (singular!) as a general anthropological feature of human subjectivity, with hardly any traction with empirical science and scientifically informed world-views, is not well equipped for this task.

The Science and Religion Dialogue in Germany in the Last 50 Years

Lay Academies

Church-run Lay Academies play an important role in the dialogue between science and religion in Germany. These institutions were founded soon after the Second World War, at first by Protestant churches and private, church-bound initiatives, a little later by Catholic dioceses, to provide a platform for dialogue and encounter between individuals and groups from politics, society, academia and economics. After the catastrophe of German Nazism and its totalitarian ideology, the academies were meant to answer the need to build a new, democratic and open society on all levels. They wanted to actively involve Christians and everybody interested in discourse and in the formation of opinions with regard to political, social, economic and scientific issues in the spirit of the gospel, a Protestant heritage and Christian values. They discussed German rearmament in the 1950s, promoted Jewish-Christian dialogue, established conversation circles between trade unions and industrial employers and management, discussed ecological issues, and promoted a critical and constructive dialogue between Christian theology and scientific world-views.

Today, there are about 20 Protestant Academies conducting more than 2,000 events each year (cf. <http://www.evangelische-akademien.de/>), and about 21 Catholic Academies (cf. <http://www.katholische-akademien.de/>). Although mainly concerned with educational programmes and social and political issues, some academies have taken a special interest in the relation between science and religion. In some of these cases, there is a local group of scientists, theologians, clergy and other people interested in the field which plans, arranges and issues invitations to conferences, lectures and seminars. For example, at the Protestant Academy in Arnoldshain the theologian Hubert Meisinger, a member of the council of the *European Society for the Study of Science and Theology* (ESSSAT), is in charge of a programme on Science and Technology. A special mention is de-

served by the Protestant Academy in Bonn which every second year hosts a local ESSSAT conference and publishes a volume with the papers presented at that conference (in German). Its director, Frank Vogelsang, a theologian and engineer, together with the theologian Andreas Losch (now at the University of Bern, Switzerland) is also in charge of a website dedicated to the dialogue between theology and science, publishing papers online on a whole spectrum of subjects (<https://www.theologie-naturwissenschaften.de/>). The Protestant Academy in Bad Herrenalb is also very active with regard to publications: here the theoretical physicist Jürgen Audretsch (of the University of Konstanz) established a series of lectures titled *Theology and Sciences in Dialogue*, which are documented in a number of books (in German) published by the academy. At the Catholic Academy of the diocese of Rotenburg-Stuttgart, the theologian Heinz-Hermann Peitz is in charge of a religion and science programme. Peitz wrote a PhD thesis on the Criteria for the Dialogue between Science and Theology according to Karl Rahner (Peitz 1998), and since 2001 he has been running one of the leading websites on science and religion, the Forum on Boundary Questions (<http://www.forum-grenzfragen.de/>). He documents actual developments in the debate via interviews, book reviews, and video and audio lectures held at the Academy. The website also hosts the Religion and Science Network Germany (RSNG, <http://www.rsng.de/>), which was sponsored as a Local Societies Initiative by Metanexus.

FEST

All Protestant Academies, together with the Protestant Church in Germany (EKD), established in 1958 an interdisciplinary research institute which from its beginning took a strong interest in the dialogue between physics, theology and philosophy, and which made an impact on academic theology via conferences and publications. In 1957/58, the „Forschungsstätte der Evangelischen Studiengemeinschaft e.V.“ (FEST) Heidelberg (Protestant Institute for Interdisciplinary Research, <http://www.fest-heidelberg.de/>) was founded by merging the South German research institute of the Protestant academy in Bad Boll with a North German institution, the Christophorus-Stift in Hemer (Westphalia) that in addition to studies on church law was active in the dialogue between quantum physics, theology and philosophy. From 1958 until 1982 the philosopher and educational reformer Georg Picht (1913–1982) served as director of the FEST. He also held the chair of philosophy of religion at Heidelberg University and wanted to bring philosophy, theology, the sciences and society into a dialogue of mutual criticism and challenge. He shared this concern with his close friend, the physicist and philosopher Carl Friedrich von Weizsäcker (1912–2007). In the 1960s the FEST grew steadily, and attracted theologians, natural scientists, social scientists and economists to join the team.

The early science-theology dialogue at the FEST was promoted by the physicist and mathematician Günter Howe (1908–1968) who was an active member of the Confessing Church (Bekennende Kirche) during the Second World War (cf. Clicqué 2001). Howe worked on ‘complementarity’ as a principle, both in physics and in theology, and identified analogies between the use of that principle in quantum physics and in Karl Barth’s doctrine of God. As early as 1949 he was the main founder of the Göttingen Dialogues (Göttinger Gespräche) between physicists and theologians on ethical questions of science, which gathered together around 25 theologians, physicists, mathematicians and chemists once a year. Later Howe was involved in the FEST in Heidelberg, and had a teaching assignment at Heidelberg University on “Boundary Issues between Theology and the Sciences.” He was deeply involved in the discussions of nuclear armament which led to the Tübingen Memorandum in 1961, a manifesto of protest against the nuclear armament of West Germany and in favour of the recognition of the Eastern border between Germany and Poland. It was signed by eight Protestant

academics and scientists (among them Werner Heisenberg, Georg Picht and Carl-Friedrich von Weizsäcker) and directed against the Adenauer government.

The physicist and philosopher Carl-Friedrich von Weizsäcker, a student of Werner Heisenberg and involved in nuclear research in Germany during the Second World War, had been one of the “Göttinger 18,” a group of eighteen leading nuclear physicists in post-war Germany who wrote a manifesto against plans to arm the West German army with tactical nuclear weapons. Since the 1940s, von Weizsäcker wrote extensively on the philosophical meaning of a scientific world-view (translation into English include Weizsäcker 1980 and 2006) and on issues of pacifism and the ecological crisis. He considered himself a radical Christian pacifist and integrated religious perspectives into his thinking. In 1970 he founded and, together with the philosopher Jürgen Habermas, led the Max Planck Institute for the Research of Living Conditions in the Modern World which was closed soon after his retirement in 1980. In 1989 he received the Templeton Prize for “Progress in Religion.” At the initiative of one of his sons, the scientist and politician Ernst Ulrich von Weizsäcker (* 1939), he participated in a discussion group at the FEST on open systems which was documented in two volumes and became an important trigger for the German discussion on entropy, information, philosophy and religion in the next decade (Weizsäcker 1986; Maurin 1981).

Another leading figure in the science-religion dialogue at the FEST was Jürgen Hübner (*1932), a German biologist and theologian who in 1966 published a dissertation under the supervision of theologian Gerhard Ebeling with the title *Theology and biological evolutionary theory. A contribution to the dialogue between Theology and the Sciences* (Hübner 1966). In his book he presents the main positions within German Protestant theology with regard to evolutionary theory since the late 19th century. Hübner identifies different types of rejection, reception and constructive integration, and finally applies Emil Brunner’s concept of a dialogical personalism and his theory of truth as encounter to the relation between biology and theology. Hübner later became instructor at the FEST and extraordinary Professor at Heidelberg University. He was the editor of the theological works of Johannes Kepler and wrote his habilitation on Kepler’s theology (Hübner 1975). At the FEST he was involved in dialogues on cosmology, but also bioethics and the relation between the arts, theology and science. In the 1980s he published a comprehensive compendium of more or less all German, and many foreign, publications on the dialogue between science and religion since 1945, with interesting introductions by different contributors to the respective parts of the collection (Hübner 1987). These introductions are still a worthwhile read and testify to the growing interest in these matters in the late 1980s when dialogue in Germany got in touch with English discourses on science and religion.

Other Institutions

The Jesuit *Munich School of Philosophy* hosts an academic institute which is dedicated specifically to the dialogue between philosophy, theology and the natural sciences from the perspective of a critical philosophy of nature. The *Institute for Scientific Boundary Issues in Relation to Philosophy and Theology* (Institut für naturwissenschaftliche Grenzfragen zur Philosophie und Theologie (ING), <https://www.hfph.de/forschung/institute/naturphilosophie>) endeavours to counter world-views of narrow scientism, as well as irrational views of an eco-holistic explanation of nature, through a thorough reflection on biological and physical science, by asking about the philosophical implications of science and by fostering interdisciplinary competence between religion and science. Among its members is the philosopher, biologist and theologian Christian Kummer SJ (*1945) who has published extensively on the relation of evolution and the Christian doctrine of creation and who can be considered a prominent, balanced and thoroughly informed voice on this issue in Germany (cf. e.g.

Kummer 2009a). His introduction to the philosophy of nature has also been well received (Kummer 2009b). He is a critic of creationism and draws his concepts from theories of self-organisation and Aristotelian becoming.

The Reception of Teilhard de Chardin

A first step towards a theological reflection on evolution from a Catholic perspective was the work of the French theologian and anthropologist Teilhard de Chardin (1881–1955). However, being banned for decades his work started to influence German Catholic theology only during the 1960s when, with the 2nd Vatican Council, a new spirit of reform opened new possibilities for dialogue. The council's pastoral constitution *The Church in the Modern World* is considered to be influenced by Teilhardian thoughts. The German philosopher, theologian and, together with his wife Nicole, translator of the works of Teilhard de Chardin into German, Karl Schmitz-Moormann (1928–1996) also worked on a critical edition of the works of Teilhard de Chardin which was never completed (see Schmitz-Moormann 1992). He was responsible for the first German edition of the works and dairies of Teilhard de Chardin in the mid-1960s and published numerous books on Teilhard de Chardin and in a Teilhardian spirit (Schmitz-Moormann 1986; Schmitz-Moormann 1996; Schmitz-Moormann 1997a; Schmitz-Moormann 1997b and others). He was also one of the founding fathers of ESSSAT, the European Society for the Study of Science and Theology (see below). His work had little influence on German catholic theology, but he won friends and colleagues among Anglophone theologians (like Philip Hefner [*1932] and Arthur Robert Peacocke [1924–2006]) and saw a deep convergence between process thought and Teilhardian views on the development of humans and life in the cosmos. Protestant theology more or less ignored Teilhard's ideas. An exception was the dissertation of Sigurd Martin Daecke (*1932) *Teilhard de Chardin and Protestant Theologie* (Daecke 1967). In this book Daecke announced a more comprehensive work on Teilhard's theology which he never completed. However, as Professor of systematic theology at the Technical University in Aachen he has been one of the promoters of the science-religion dialogue in Germany since the 1970s.

Still, the defense of Teilhard by Jesuit theologians in the wake of the 2nd Vatican council led to more open and constructive discussions on theology in general, and on science and the theory of evolution in particular. The most important Catholic German theologian in this respect was Karl Rahner (1904–1984). He referred to Teilhard de Chardin only occasionally, but his theology can be regarded as influenced by him. Rahner started by working on the question of hominization, the theory of the evolutionary origin of humanity. His book on this question first appeared in 1958; in a revised version he re-published it in 1961 together with the Jesuit anthropologist Paul Overhage (Overhage and Rahner 1961). Overhage (1906–1979) himself published a series of books in the 1960s and 1970s on evolution from a Catholic perspective. Rahner tried to mediate between the official teaching of the Church regarding the immortal soul of human beings and biblical creation accounts by discussing fundamental concepts of becoming, of cause and determination, of spirit and matter, and of the creation of a spiritual soul. He then developed the notion of active self-transcendence as a principle of the dynamics of creation. He sees creation as an ongoing process leading towards an ever greater richness of life, in which something new indeed emerges. In and through this process the creator is in creative interaction with creation, which includes God's self-communication to the world in Jesus Christ. However, in contrast to secular evolutionary biologists, Rahner understood the evolutionary process to be directed toward the emergence of the human being, in which nature comes to self-consciousness. The whole of creation moves toward an ever closer and more conscious relationship to its Creator. Rahner's publications regarding the relationship between theology and science are now collected in vol. 15 of his collected works (Rahner 2002).

The Founding of ESSSAT

With regard to the institutionalization of the science-theology dialogue and connection with the English-speaking discourses in the 1980s, the *First European Conference on Science and Theology* (ECST) 1986 at the Protestant Academy in Loccum has to be mentioned. It was dedicated to the subject “The Argument about Evolution and Creation.” Among the participants were the German biochemist and Nobel laureate Manfred Eigen and the British biochemist and theologian Arthur Peacocke. An important founding father of this conference, which turned out to be the first of an ongoing series of European conferences, was Karl Schmitz-Moormann (see above). Since 1986 every second year another European city has hosted the ECST with usually about 200 participants, mainly from Europe. At the third of these conferences in 1990 in Geneva, the *European Society for the Study of Science and Theology* (ESSSAT) was founded, the bylaws being prepared by a group which included Svend Andersen, Viggo Mortensen (Denmark), Bernard Morel (France), Michael W. S. Parsons, Arthur Peacocke (UK), Karl Schmitz-Moormann, and Christoph Wassermann (Germany). ESSSAT and ECST exist to this very day and publish two series of proceedings of the conferences (IST [*Issues in Science and Theology*], recently changed into ISR [*Issues in Science and Religion*], and SStH [*Studies in Science and Theology*]). Since 2005, in the years in between the European Conferences a local German ESSSAT conference is organized at the Protestant Academy of the Rhineland in Bonn (see above).

Karl-Heim-Society

Another initiative is the *Karl-Heim-Society* (Karl-Heim-Gesellschaft, <http://www.karl-heim-gesellschaft.de/>) which was founded in 1974 and which today has about 700 members (Schwarz 2012, 113). It is dedicated to the work of the German theologian Karl Heim (1874–1958), one of the pioneers of the science-religion dialogue in Germany, who had his roots in Swabian pietism. The society organizes an annual conference on science and religion and publishes the newsletter *Evangelium und Wissenschaft (Gospel and Science)* twice a year. Since 1988 it has also published an academic yearbook with the title *Glauben und Denken (Faith and Reasoning)*, volume 27 in 2014) in which theologians and scientists from different disciplines publish essays on a large variety of subjects. Since 2006 it has been edited by Ulrich Beuttler (Erlangen) und Martin Rothgangel (Wien, Professor of Religious Education). President of the society is Hans Schwarz (*1939, Lutheran Professor emeritus for systematic theology at Regensburg University) who has also published widely in the field of science and religion. He spent part of his early academic career in the US, and quite a number of his writings are published in English, including his recent overview of 400 years of dialogue between theology and science (Schwarz 2014).

Evangelical Institutions and the German Debate on Creationism

Although the *Karl-Heim-Society* began with a strong evangelical profile, it soon opened up to more liberal versions of theological and philosophical thinking. This led to the establishment of a creationist and evangelical initiative which was founded by Horst W. Beck (1933–2014) in 1981 called *Wort und Wissen (Word and Knowledge)*, located in the Black Forest in Baiersbrunn (<http://www.wort-und-wissen.de/>). This “Studiengemeinschaft” (research community) is an association mainly of Christian scientists who promote a biblical doctrine of creation. They are financed mainly by donations from their 230 or so members (<http://www.zeit.de/zeit-wissen/2006/01/Kreationisten.xml>), and are able to employ four members of staff, three scientists and a biblical archaeologist. There is no academic theologian involved in this initiative (for a critical evaluation cf. Kutschera and Beyer 2007).

Wort und Wissen attracted public attention and massive criticism when in 1986 it published an alternative creationist ‘critical’ schoolbook for biology courses, now available in its 7th edition (Junker and

Scherer 2013). In its 5th edition, it won a textbook prize in 2002 awarded by a private Christian association, and the laudation at the prize ceremony was given by the prime minister of the state of Thuringia. However, the book is not allowed to be used in schools and is only for private study. It is written by biologist Reinhard Junker (*1956), who in 1992 also received a theological degree from the private *Evangelische Theologische Faculteit* in Leuven, Belgium, and by microbiologist Siegfried Scherer (*1955) who holds a chair in microbiology at the Technical University, Munich. The textbook argues along the lines of certain Intelligent Design arguments and, in the first editions, favoured a form of young Earth creationism. Still the whole creationist movement in Germany is by far less aggressive, less political and much more aware of epistemological pitfalls than many of its North American counterparts. Apart from certain areas in Germany with a strong pietistic and evangelical tradition, there is also not much support for creationism and Intelligent Design. What is shared by many is the concern that a theory of evolution in a reductionist and ideological interpretation, which puts chance at the centre of interpretation, questions moral obligations on biological grounds and rejects any form of religion as superstition, is dangerous and must be dismissed. According to a poll from 2005, about a third of the German public believe in a creative force which transcends the laws of nature. Thus on one side, there is a widespread belief that scientific explanations are not the whole story. On the other side, there is nearly no public pressure to teach something like creation science in biology classes, since religious education is a proper school subject (see above) and questions of the relation between evolution and creation and a critical reading of biblical stories on creation are part of the regular curricula in these classes.

Humanist societies and teachers of biology protested against this textbook, and in the media an (at times shrill) discussion about the concepts of Intelligent Design and creationism began. This coincided with a guest commentary in the *New York Times* in 2005, written by Cardinal Christoph Schönborn (*1945), Archbishop of Vienna, with the title *Finding Design in Nature* (Schönborn 2005). Schönborn argued that not chance, but a divine plan and a creator God must be assumed to be responsible for the course of evolution, and he was heavily criticized for this article. During his PhD studies, Schönborn had studied under Pope Benedict XVI, then Joseph Ratzinger, at Regensburg University and he is an influential member of the group of former students (including 16 professors, mostly Germans) of Joseph Ratzinger. Since Joseph Ratzinger was elected Pope in 2005, this group meets once a year in Castel Gandolfo (Rome). Benedict XVI suggested as the topic for the first meetings (2006 and 2007) the issue of "Creation and Evolution." It has been speculated that Schönborn's commentary in the *New York Times* and this meeting were part of an initiative to question naturalist interpretations of evolution and to publically promote an alternative view of cautious intelligent design. The papers given at this meeting were published (Horn and Wiedenhofer 2007) and, surprisingly, Pope Benedict in his introduction quoted the creationist textbook just mentioned (Horn and Wiedenhofer 2007, 18). All this led to some public discussion on evolution, Intelligent Design and religious world-views in Germany, which had its peak between 2005 and 2009, but then collapsed during the Darwin-year 2009 and can be considered dead at the moment.

It is also significant that the latest edition of the creationist textbook more or less abandons a young Earth creationist view as well as the argument from design as promoted by the Intelligent Design movement, mainly for epistemological reasons: "The inference from scientifically evident deficits of explanation to transcendent causes in the case of bio-molecular machines [like the bacterial flagellum] is not tenable" (Junker and Scherer 2013, 175). In their final chapter the authors concede that every open question with regard to evolution should be taken as stimulus for further research, but must not be taken as conclusive proof for alternative views such as a notion of direct creative acts.

On the whole, the textbook is testimony that, at least in the German context, criticisms of creationism and Intelligent Design have led to certain retractions on the creationist side and a clearer view on the real issues at stake: epistemology, inference from facts to values, the experience of evil as questioning the idea of a designer God, and others.

Naturalist Debates

An interesting debate on the relation between Atheism, Religion and Science can be found in the recent issue of the journal “Erwägen-Wissen-Ethik” (roughly translating as “Deliberation-Knowledge-Ethics”), which seeks to provide a platform for open discourse on important issues in all areas of knowledge and society. In every issue, a main article by an invited author opens the discussion. Then shorter responses from many authors from different fields and representing a plurality of opinions follow, referring to the numbered paragraphs of the main article which was sent around to all participants of the dialogue. Finally the author of the main paper closes the issue with a response to some or all of the responses. This interdisciplinary journal, which covers an extremely broad spectrum of subjects, including social theory, mathematics, philosophy, modern music, psychotherapy, biology, history, religion and theology, published its 25th volume in 2014. A list of subjects and participants can be found at <http://groups.uni-paderborn.de/ewe/index.php?id=103>. The main article is only occasionally in English.

The last issue in volume 25 (2014) dedicated to the subject of *Atheism, Religion, and Science* (Wissenschaft). In his main article the retired professor of religious studies at Tübingen University, Günter Kehrer (*1939), who is a confessing atheist (Kehrer 2014b, 177) and a leading figure in the Giordano Bruno foundation, a “think tank for humanism and enlightenment” (<http://www.giordano-bruno-stiftung.de/en>, see below), states a more or less total victory of science over religion, so “that there are no more conflicts between science and religion because scientific research [(Natur)Wissenschaften] is done in a factually atheistic way: God does not play any role in the arguments” (Kehrer 2014a, 1). In his view, Christian churches and theology have withdrawn from formulating substantial (that is, testable) claims with regard to God and nature. On the other hand, the academic empirical and historical study of religions has adopted a methodological agnosticism with regard to religious truth claims, so that these studies cannot bring to bear their critical potential against religious beliefs. The prevailing functional approach towards religion as being helpful for society, individuals and communities even allows for an unspecific affirmation of religion ‘as such.’ In this situation of a mutual no-challenge clause, science is restricted, to Kehrer’s regret, to the fight against creationism and fundamentalism without having a formative effect on society as a whole. Kehrer’s article has provoked responses from the unusually large number of 69 authors from theology, philosophy, religious studies, biology, sociology and other fields, some of which support his thesis while some of his atheist combatants argue for a lasting significance of atheist propaganda, and others, mainly theologians, argue against Kehrer’s view of a complete isolation between religion and science. This discussion gives a comprehensive overview of the broad spectrum of positions with regard to science and religion in Germany.

Leading Voices in Theology

Wolfhart Pannenberg

Theology in the 1960s in Germany was still dominated by Barthian theology on one side and hermeneutical existentialist theology, as found in Bultmann’s school, on the other side. For none of these theologies did the dialogue between science and religion really matter, because it was seen as a fu-

tile attempt to justify faith by means of natural theology. Then a younger generation of scientists and theologians engaged in new forms of discourse, and one fruit of these conversations was a little booklet published by the physicist A. M. Klaus Müller (1931–1995) and the systematic theologian Wolfhart Pannenberg (1928–2014), with the programmatic title *Considerations on a Theology of Nature* (Müller and Pannenberg 1970). Müller contributed an essay on the epistemology of science (Müller 1970) in which he argued for the relevance of philosophical discourse for scientific discoveries and theory-building. Two years later he published a large volume *Die präparierte Zeit (Prepared Time)* on the philosophy of time, which became a classic in the German dialogue on science and theology (Müller 1973: see the references to Müller’s work in the indices of Pannenberg 2001 and Moltmann 2005). It was dedicated to Günter Howe and inspired by von Weizsäcker’s view on the irreversibility of quantum events as a realisation of contingent possibilities. Müller applied that idea to physics itself, and described the process of scientific research as historical endeavour which, in the case of physics, ‘prepares’ time in order to reduce it to a linear parameter. Time in the full sense must be seen as a kind of matrix of relations in which all three modes of time (past, present, future) are understood as possible modifications of each other, so that the complexity of time is a network of modes of time like the past of the present or the future of the past or the present of the future, etc. Insofar as Physics wants to identify unchanging laws of nature it is limited to a view of time which reduces it to a kind of eternal presence of past, present and future and cannot account for the historicity of events and the emergence of something new. Science has to ‘prepare’ time, to fix it as an objective parameter, and thus loses the right sense of the fullness and the challenges of time. Science is also partly responsible for the present crisis of humanity because it alienated human existence from the historicity of nature and propagated the delusion of absolute command through scientific-technical means. Here again we encounter the dominance of ethical questions, which characterizes the dialogue of science and theology in Germany right from its beginnings after the Second World War.

As early as 1961, Wolfhart Pannenberg, the theological partner in Müller’s project exploring a theology of nature, in cooperation with exegetical (Rolf Rendtorff, Ulrich Wilckens) and other systematic theologians (Trutz Rendtorff) mainly from Heidelberg, had published a volume with the programmatic title “Revelation as History” (Pannenberg 1982, English translation W. Pannenberg et al. 1969). Inspired by the Old Testament scholar Gerhard von Rad and his idea of historical traditions as confessions of a community, paradigmatically found in the cultic ‘historico-salvific Credo’ (Deuteronomy 26:5–9) as its most succinct formulation, this group wanted to provide an alternative to the predominant schools of a Barthian neo-orthodoxy on one side (referring to positive, scriptural revelation and separating Christian belief in revelation from religion as human enterprise) and of a hermeneutical theology in line with Bultmann on the other side, which identified non-historical existential concerns as the centre of theological interpretation. With their concepts of faith in revelation and of demythologizing the scriptures, both theologies seemed to isolate Christian theology and religion from history as well as from scientific world-views. In Pannenberg’s view, they were in danger of basing theology on subjectivist beliefs rather than on historical and scientific insight, and as a consequence were incapable of proper arguing with the world of science and of other religions. For Pannenberg, revelation is a historical process which is universal and open to the eyes of anyone who can see. In 1964, shortly after producing this highly controversial manifesto on revelation and history, Pannenberg applied his concept of history to Christology (Pannenberg 1976a, English version Pannenberg 1987). In this book he understands Jesus’ resurrection as an historical event and as the *prolepsis* (anticipation) of the final destination of creation, which reveals the meaning of history. Against the

background of this view of history he developed a new understanding of theology and its method in relation to the natural sciences.

His first publication in the field of science and theology was his contribution to the above-mentioned co-publication with A. M. Klaus Müller, in which Pannenberg developed his view on the contingency of nature (Pannenberg 1970, English in Pannenberg 1993). Contingency, in the sense that what is contingent could be otherwise, is a main feature of nature, even in the perspective of science. Pannenberg develops a regularity view of the laws of nature, seeing them as human constructs in order to describe the regular aspects of reality. They are ad hoc conjectures which try to predict the outcome of natural processes by modelling relevant parameters in mathematical terms. Not only do laws of nature rest on contingent events ('Geschehenskontingenz', Pannenberg 1970, 63), they must be understood as fallible descriptions of regularities and thus as contingent themselves. They depend on the constraints of human imagination, on the historical development of science, on the consensus of the scientific community, on the limits of mathematics and computation, etc. Given that a plurality of perspectives, aspects and designs of a theory are possible, and also given that the things described cannot be reduced to certain regularities but show endless variations in time, space and properties, so that they cannot be isolated from the rest of reality, no law and no ensemble of laws can describe contingent reality exhaustively. Beginning with this early work on contingency, Pannenberg has received considerable attention outside of Germany and has influenced debates in the US (Robert J. Russell, Ted Peters, Philip Hefner, Philip Clayton and others), the Netherlands, South Africa and Scandinavia (Niels H. Gregersen and others, see the introduction by Gregersen in Pannenberg 2008).

In his full-blown systematic theology, Pannenberg elaborates extensively on his concept of salvation history as universal history, with the life, death and resurrection of Jesus as the absolute and final revelation of its meaning in a single historical event which anticipates an absolute future as the final goal of creation. Although Pannenberg was able to design his theology in close contact with general scientific, epistemological, and anthropological studies as well as within a general view on religions as historical phenomena, his idea of history as objective revelation and his view of theology as an objective academic discipline in close analogy to empirical science (see Pannenberg 1973, English: Pannenberg 1976b) was rejected by more or less all German theologians including his former Heidelberg fellow campaigners. On the other side, Pannenberg's parting from positivist understandings of scriptural revelation and from subjectivist or existentialist foundations of Christian theology prevailed. But his direct reference to scientific concepts such as field, energy, laws of nature etc. as foundational concepts both in science and theology, his unmediated theological interpretation of cosmology and evolution, his claim that Christian theology is able to provide the best explanation resting on scientific concepts and insights and surpassing it by referring to objective historical disclosures, and his rather cognitive approach towards religion, theology, doctrine and faith, which for many does not do justice to fundamental hermeneutic, existential, subjectivist and symbolic dimensions of religion – all this isolated his work within the German context of academic theology, when the 1990s saw a massive rise and later dominance of neo-liberal theology.

Jürgen Moltmann

In his book on the doctrine of creation, first published in 1985 (Moltmann 1987), English: (Moltmann 2005), Jürgen Moltmann (*1926) aims to develop an understanding of creation in close dialogue with and integration of science, but without sacrificing theological wisdom to narrow scientific knowledge. Moltmann attempts to overcome the classical subject-object divide within Western doctrines of creation, which understands the creator as the absolute subject and creation as the creator's totally

dependent, intentional object. God acts with creation by bringing it into being out of nothing, and by preserving and redeeming it. God is the active agent, while creation is the secondary result of divine agency and the object of divine command and authority. In Moltmann's analysis, the Western doctrine of creation was conceptualized as a centralist model of hierarchical sovereignty. It is his concern to develop an alternative model which is ecological, in the sense that it envisions the creator within creation without identifying creator and creation. The process of creation thus becomes a communicative and mutually informative process between creator and creation. In his doctrine of the Trinity, Moltmann developed a model of social trinitarianism which emphasizes that God is an inherently social being, constituted by mutual exchange and intense mutual enrichment (*perichoresis* as indwelling of the divine persons). His ecological doctrine of creation, then, is the consequent next step. If we "cease to understand God monotheistically as the one, absolute subject, but instead see him in a trinitarian sense as the unity of the Father, the Son, and the Spirit" (Moltmann 1987, 16) then we can overcome paternalistic and one-sided models of creation as well. The link between the triune deity and creation is the spirit who stands for the presence of the divine in all things. This is understood as God's indwelling (Shekinah) in a world with which God is in constant interaction, which corresponds to God, and which the creator intends to draw towards fulfilment. Thus the relation between creation and creator corresponds the inner being of God-self, the perichoresis of the trinitarian persons: "In their essential difference, God and creation are seen to be so intertwined that we can talk about God in creation, and creation in God (*perichoresis*)" (Moltmann 2013, 134). Moltmann understands this relation between God and creation to be reflected in certain scientific models and theories which stress the openness, creativity and dignity of creation, and also in the enterprise of modern science as such. Quantum theory, the theory of open systems, evolution as a creative process, and human beings as organisms experiencing time and developing moral responsibility are scientifically valid concepts which correspond to important claims of a Christian doctrine of creation.

An open, developing creation is contingent. It cannot be deduced from eternal principles, but has to be approached via empirical methods and precise observation (cf. Moltmann 2011). While science infers laws and constants from observation and experiment, theology is concerned with the contingency of the orders and entities of nature, and refers to them not only as an indication that nature owes its existence and fundamental properties to the intention of the Creator, but also as a sign that nature is capable of being transformed into a new creation, and even into the eternity which Moltmann understands as the fulfilment of time. So instead of timeless eternity, creation moves towards eternal time (Moltmann 2003, 46). The difference between contingent creation and creator is determined by divine self-limitation: the Creator provides time, space and potentialities for creation by withdrawing and thus giving way for relatively autonomous, self-dependent creatures. The relative can co-exist with the Absolute to the extent to which the Absolute withdraws itself. God is not, as Bultmann put it, the 'the all-determining reality', but the all-pervading and loving reality whose power is not totalitarian determination, but the gracious self-determination of the divine being as creator, companion and redeemer in favour of creatures.

This fundamental turn has several consequences. For one, creation has to be understood as fundamentally unfinished, and time, temporality, history and future become the central category in such a doctrine of creation. For example, the future is not just the extrapolation of the past, but is open to further creative acts of God. For Moltmann, future is not simply *futurum*, just the unfolding of what is already determined through the past, but *adventus*, the arrival of God's creative future. Secondly, God's presence in creation is subtle and interpreted pneumatologically in terms of spiritual presence to which human beings correspond not through empirical knowledge, but through wisdom. Thirdly,

Moltmann is obviously an advocate of the integration model between science, religion and theology. The pivotal category of this integrative view of reality is wisdom, while the realm of performance and justification for this integration are justice and ecology. This integration is an ongoing task, since science develops and changes, but also the challenges theology has to meet are in constant flow. The dialogue between science and theology with the goal of constructive integration thus has to be, in Moltmann's view, a dialogue of mutual enrichment and mutual challenge: "Today the dilemma between theology and science is no longer that they present conflicting statements. It is rather the lack of conflict between statements which stand side by side without any relation to one another, and which no longer have anything to say to each other at all. Faith and knowledge of the world are no longer locked in a conflict about the truth. They are resting side by side in a vacant co-existence" (Moltmann 2003, 2). Although Moltmann, at the beginning of his theological thinking, was influenced by Karl Barth, he now pleads for a new theology of nature and for that purpose employs the old model of the two books, the book of scripture and the book of nature, which interpret each other. Reading the book of scripture stimulates scientific research, while reading the book of nature stimulates the search for the purpose of creation, and both awaken curiosity about God's presence in all things.

Others

The Bochum systematic theologian Christian Link (* 1938) is a representative of a Barthian theology in the reformed tradition. However, he took Karl Barth's decision not to refer to scientific theories and concepts in his doctrine of creation as only preliminary and owed to unsatisfactory categories. He agreed with Barth that no natural theology in the traditional sense of a preamble of positive theology is possible, but still argued for the development of a new theology of nature. In his early book on the world as parable (Link 1982) he interprets Jesus' use of parables as an indication of nature's capability to point to the purpose of human existence, as well as to its own eschatological destination. Nature as parable does not presuppose God's being, but God's coming. In the second of his two volumes on creation from 1991, Link deals extensively with the dialogue between science and theology (Link 1991a and 1991b), but apart from process philosophy and process theology he more or less leaves aside the English discourse on science and religion. He understands creation as an open system and identifies time as the common horizon of theology and science. Again, he refers to A.M. Klaus Müller's concept of time (Müller 1973) and considers science as a reductionist enterprise which reduces time to a parameter of measurement. Christian theology with its perspective inspired by the resurrection of Christ and reaching out from all past into God's future provides a complementary, but not necessarily rival perspective of the fullness of time. Recently Link has published a new version of his doctrine of creation in which he has reworked the relation between science and religion, now referring to John Polkinhorne's and Ian Barbour's versions of critical realism (Link 2012).

The Vienna professor of systematic theology, Ulrich Körtner (* 1957) has also often referred to science in his theological writing, but has done so from within a hermeneutical perspective. He strictly distinguishes between faith and theology. The issue between science and religion, in his view, is between theology as rational explication of basic religious beliefs and world-views based on scientific concepts and theories. The purpose of a dialogue between these two approaches towards reality cannot be mediated by any kind of natural philosophy, but must be moderated by hermeneutical reflection. The aim of any science-religion discourse is the increase of complexity and constructive mutual criticism rather an integrated 'theory of everything' (Körtner 2013). Körtner has written on apocalyptic thinking (English translation: Körtner 1995), on faith in creation (Körtner 1997) and at

different occasions on theological interpretations of the theory of evolution (see the edited volume 2007).

Neo-liberal Mainstream

Neither the theology of Wolfhart Pannenberg nor that of Jürgen Moltmann made a lasting impact on German academic theology. Pannenberg's cognitive-propositional theology of salvific history in close contact with science lost plausibility against post-modern criticism, with its reference to irreducible pluralism, and against the deconstruction of teleological views of history in the tradition of Troeltsch's analysis of the problems of historicism. Moltmann's political-eschatological theology lost part of its attractiveness once the aftermaths of the 1968 revolution decayed and the cold war was over. Moltmann's theology was often seen as means to political and ecclesiastical ends and seemed to lose traction when political challenges changed. His style and way of doing theology had the bad reputation of "methodological sloppiness" (Fischer 2002, 184) musing in "poetical exuberance" (Fischer 2002, 188) rather than in intellectual rigour.

Rather, the 1980s saw an upswing of (neo-)liberal theology, both in the academia as well as with some delay in the churches, which regarded any exchange between religion and science as superfluous and illusionary. This renaissance of liberal theology in Germany, which in George Lindbeck's terms belongs to theologies of "experiential-expressivism" (Lindbeck 1984, 16), is marked by the foundation of two learned societies dedicated to the heritage of two heroes of theological liberalism, namely the Ernst-Troeltsch-Society (founded in 1981) and the International Schleiermacher-Society (founded in 1996) which complemented the German Paul-Tillich-Society (already founded in 1969). The majority of German Protestant theologians, and important individuals within Catholic theology as well, are organized in these societies. In 2012 all three societies gathered together for a big convention with the title "Enlightened Religion and Its Challenges" ("Aufgeklärte Religion und ihre Probleme", cf. the proceedings Barth et al. 2013). With this title they demonstrate their vision of the task of theology: to transform religion in modernity in the tradition of the German enlightenment, i.e. with regard to historical criticism, to the vanishing importance of institutional religion, to radical pluralism and to religious individualism.

This led to a concentration on the conditions of culturally-mediated religious self-understanding as expressed in symbolic language and thus to a neglect of questions of creation and nature. Creation does not refer to a process of cosmogony or to certain features of nature, but to certain modifications of religious consciousness which Schleiermacher developed in a paradigmatic way as the universal feeling of absolute dependence. To quote from an essay of the Schleiermacher scholar, systematic theologian and founding president of the International Schleiermacher Society Ulrich Barth (*1945) from 1995, titled "Farwell to Cosmology": "Since Schleiermacher – that can be stated without exaggeration – the conflict between theology and the natural sciences about questions of cosmology is not an issue anymore" (Barth 2003a, 424). By establishing a rigorous difference between religious and scientific perspectives, "any conflict between physical cosmology and religious interpretation of the world (religiöse Weltdeutung) is in principal excluded" (Barth 2003a, 424). A theologically sound and critical doctrine of creation must devise itself as reflection on the finitude of human existence (Endlichkeitsreflexion), but not as a theory about natural processes.

Religious interpretations are symbolic and not realistic, while theology is understood as a second-order interpretation of religious symbolism. Rather than dealing with God, theology has to deal with religion as a cultural-anthropological phenomenon. Questions of divine action etc. are of no theolog-

ical value because the symbolic notion of creation refers to the transcendental unity and depth of reality, which is empirically identical with the process of reality and does not refer to a creator. Consequently, Ulrich Barth understands evolution in the light of idealist philosophy, and refers to Schelling as the inventor of the idea of an evolution of nature which brings about life-forms and self-conscious beings (Barth 2003b). “God” is understood as a purely functional idea of the absolute unity (cf. the Kantian notion of regulative ideas) and depth of creation. The Absolute stands for the potency of nature for self-organization and is a symbol for the “non-empirical conditions of empirical factual states” (Barth 2003b, 478). It would be an interesting question to ask if this neo-liberal concept is structurally, or even content-wise, identical with or different to what in the English science-religion debate is labelled as religious naturalism. This German, idealist version, however, fosters the complete abstinence of any dialogue with scientific research and rests its argument completely on non-empirical theories of subjectivity, culture and human self-consciousness.

Michael Welker

An exception within German Protestant Theology is Michael Welker (*1947) who, having received his theological PhD under the supervision of Jürgen Moltmann, pursues what he calls “realistic theology” (Welker 2005, 12). He wants to relate academic theology to concrete areas of human experience by making extensive use of biblical traditions as canonic memory, and as a means to deepen human understanding of reality, politics, culture, church, science etc. For that purpose he has been engaged in many international science-religion projects and has published widely on science and creation, both in German and in English (Welker 1999). He has also written on specific theological issues like the reality of resurrection, which he relates to scientific perspectives (cf. Peters, Russell, and Welker 2002). In his understanding religious faith must not be misunderstood as subjectivist certitude, as in certain forms of liberal theology which is in danger of renouncing any form of realistic traction of faith with empirical reality. Realistic faith is in fact ignited by experiences of concrete evidence which engage individuals and communities, enabling them to participate in the movement of God’s kingdom towards liberation and salvation. Since this happens on different levels, in different contexts, with regard to different concrete issues and to different people, Welker also tries to analyse these processes of faith and engagement in pluralist and thus ‘post-modern’ perspectives.

In his early book on the Holy Spirit he describes the Holy Spirit as a concrete life-giving force field, or rather a field of fields that work towards the well-being of all human beings and of all creation. This force-field is responsible for early experiences of salvation from collective difficulties and guilt, as testified by the history of Israel. It has become active in public forms of prophecy and renewal and was realized and concentrated in Jesus as the Christ and subsequently at Pentecost as a new public force-field. In his recent books on Christology (Welker 2012a, English: Welker 2013), Welker opens with harsh polemics against what he calls subjectivist forms of theology, which he rejects as empty, neuroticizing, bourgeois and escapist (Welker 2013, 39–47, esp. 45). He then tries to spell out in a pluralist historic perspective the forms of transformation through Jesus Christ to which the scriptures of the New Testament bear witness.

Recently Welker has also given an overview of the dialogue between theology and science, asking what the specific contribution of theology might be (Welker 2012b). Welker identifies five answers to this question which are all helpful perspectives in their own right: (1) Theology can meet science in meta-level discussions; (2) it must explain its own core concerns in a way relevant to science and correcting false understandings of theology; and (3) it must work on the transformation of distorted historical perspectives on both theology and science insofar as they burden the dialogue. Welker

himself most passionately advocates the fourth and fifth approaches, concentrating on (4) “multi-perspectival explorations of areas of knowledge common to both” and (5) “small bridge building.” In addition, Welker has supervised several doctoral theses on figures of the English science-religion dialogue, among them a presentation of the work of Ian Barbour by Christian Berg (Berg 2002).

Recent Developments and Contributors

Since 2000, the science-religion/theology dialogue in Germany has gained momentum inspired by the debate in English-speaking academia. In terms of publications, the book series *Religion, Theologie und Naturwissenschaft / Religion, Theology, and Natural Science* (RThN), edited by Christina Aus der Au, Willem B. Drees, Antje Jackelén and Ted Peters and published by Vandenhoeck & Ruprecht in Göttingen, has become a major series for monographs and anthologies both in German and in English in the field of science and religion. It started in 2003 with the German translation of Ian Barbour’s *Religion and Science* (Barbour 2006) and has recently published volume 29, a study by systematic theologian Markus Mühling (*1969) on *Resonances: Neurobiology, Evolution and Theology* (Mühling 2014). Mühling identifies resonances and convergences between different neurobiological and evolutionary theories, namely between theories of embodied cognition and theories of evolutionary niche construction. Both theories bid farewell to the notions of representation of or adaptation to reality, and instead focus on constructivist versions of reciprocity between organism and environment: these are what Mühling calls resonances. Applied to theology, he advocates religious views on reality not as interpretations of facts, but as resonating mutual interactions between human beings and reality in which believers see reality *as* something and do so unmediated by reflection. Faith is the resonating perception of a self-representation of the divine being within creation. It must be acquired while being guided by tradition and will result in an informed perception of the divine in, with and under certain phenomena of reality. Other volumes in the series deal with anthropology and neuroscience in a perspective of the second person (Au 2011), with the ontological status of quantum indeterminacy (Ijjas 2011) and with the transition from medieval anthropology and philosophy of nature to early modern science (Achtner 2008).

The Tübingen Catholic theologian Hans Küng (* 1928) has recently written a very popular book on science and religion, which promotes a model of complementary coherence between both fields and seeks to eliminate ad hoc and unjustified transitions from science to religion and back. A critical dialogue between both realms of human thinking is necessary in order to revise shortcomings, errors and false claims of absoluteness on both sides. However, although his book was a bestseller for some time, it hardly made any impact on academic discourse. I finish my short overview with references to some recent general studies on the relation between religion, theology and science, both historical and systematic, from which one can access current discussions in Germany about methods and subjects in the field. Above I have mentioned Hans Schwarz’ account of 400 years of dialogue between theology and science, which deals with Germany extensively and which is translated into English (Schwarz 2014). A critical assessment of central issues, mainly between naturalistic and Christian theological accounts, is offered by the anthology *Future Perspectives on the Dialog between Theology and the Sciences*, which contains essays (some in English) on naturalism, anthropology, religious experience and criteria for a fruitful interdisciplinary dialogue (Becker and Diewald 2011). In his PhD-thesis *Beyond Conflict (Jenseits der Konflikte)* Andreas Losch (*1972) presents a critical-constructive study of the relation between theology and science which tries to expand the notion of critical realism by employing the hermeneutical and epistemological concepts of Michael Polanyi and Viktor von Weizsäcker (Losch 2011). The catholic theologian and philosopher of nature Hans-Dieter Mutschler (*1946), who teaches philosophy in Kraków (Poland), has recently published a volume arguing

against the exaggerated claims of materialist naturalism with the title *Halved Reality* (Halbierte Wirklichkeit), in which he identifies analogies between naturalist and Hegelian monism which both lead to self-abrogation (Mutschler 2014). In the last chapter he sketches the alternative of a narrative theology of nature with strong reference to science.

Conclusion

In Germany, the interaction between science, religious views, ultimate concerns, unconditional values and theological reflection will presumably continue to be only a side-line of academic discourse. Although the need to catch up with international, English speaking academic research will increase and research will increasingly become global and interdisciplinary, the main focus may well continue to be on the domestic discourse at the intersection of the academia with society, churches and ethical challenges. Because this discourse usually turns towards ad hoc subjects and, with regard to high standard academic publications, is limited to PhD theses and isolated, sporadic essays, it has not developed (and in the near future is unlikely to develop) ongoing threads of discussion, whether on particular issues or on fundamental questions, which might have a significant impact on the way theology is done in Germany. German academic theology is mainly related to cultural studies, and is less interested in, and hardly competent in relating to, different fields of science. However, there is a growing challenge for academic theology as it is increasingly confronted with different and specific forms of secularism in Germany, and with demands to provide orientation within an ever-diversifying spectrum of religious, quasi-religious and non-religious views of reality. Theological and inter-religious competence might to an ever-increasing extent depend on the competence to relate to developments deeply intertwined with scientific research and technological progress. The borderline between the natural sciences, cultural studies and the humanities is already blurred with regard to new inter- and trans-disciplinary fields of study, like cognitive science, theories of consciousness, and others. In the broad sense of a better understanding of the interplay between science and human values in present-day secular Germany, the science-religion dialogue might prove to be of the utmost importance. And as a point of reference for post-liberal theologies which do not focus on the cultivation of subjectivist religious consciousness, but look for mutual resonances and mutual challenges between tradition and reality, it might serve as an important field of corroboration.

References

- Achtner, Wolfgang. 2008. *Vom Erkennen zum Handeln: Die Dynamisierung von Mensch und Natur im ausgehenden Mittelalter als Voraussetzung für die Entstehung naturwissenschaftlicher Rationalität*. Religion, Theologie und Naturwissenschaft 12. Göttingen: Vandenhoeck & Ruprecht.
- Au, Christina aus der. 2011. *Im Horizont der Anrede: Das theologische Menschenbild und seine Herausforderung durch die Neurowissenschaften*. Religion, Theologie und Naturwissenschaft 25. Göttingen: Vandenhoeck & Ruprecht.
- Barbour, Ian G. 2006. *Wissenschaft und Glaube: Historische und zeitgenössische Aspekte*. 2nd ed. Religion, Theologie und Naturwissenschaft / Religion, Theology, and Natural Science 1. Göttingen: Vandenhoeck & Ruprecht.
- Barth, Ulrich. 2003a. "Abschied von der Kosmologie: Welterklärung und religiöse Endlichkeitsreflexion." In *Religion in der Moderne*, 401–26. Tübingen: Mohr Siebeck.
- . 2003b. "Gott und Natur: Schellings metaphysische Deutung der Evolution." In *Religion in der Moderne*, 461–81. Tübingen: Mohr Siebeck.
- Barth, Ulrich, Christian Danz, Friedrich W. Graf, and Wilhelm Gräb, eds. 2013. *Aufgeklärte Religion und ihre Probleme: Schleiermacher – Troeltsch – Tillich*. Theologische Bibliothek Töpelmann 165. Berlin: de Gruyter.
- Becker, Patrick, and Ursula Diewald. 2011. *Zukunftsperspektiven im theologisch-naturwissenschaftlichen Dialog*. Religion, Theologie und Naturwissenschaft / Religion, Theology, and Natural Science 22. Göttingen: Vandenhoeck & Ruprecht.
- Berg, Christian. 2002. *Theologie im technologischen Zeitalter: Das Werk Ian Barbour's als Beitrag zu Verhältnisbestimmung von Theologie zu Naturwissenschaft und Technik*. Stuttgart: Kohlhammer.
- Clicqué, Guy M. 2001. *Differenz und Parallelität: Zum Verständnis des Zusammenhangs von Theologie und Naturwissenschaft am Beispiel der Überlegungen Günter Howes*. Untersuchungen zum christlichen Glauben in einer säkularen Welt 1. Frankfurt am Main: Peter Lang.
- Daecke, Sigurd M. 1967. *Teilhard de Chardin und die evangelische Theologie: Die Weltlichkeit Gottes und die Weltlichkeit der Welt*. Göttingen: Vandenhoeck & Ruprecht.
- Fischer, Herrmann. 2002. *Protestantische Theologie im 20. Jahrhundert*. Stuttgart: W. Kohlhammer.
- Horn, Stephan O., and Siegfried Wiedenhofer, eds. 2007. *Schöpfung und Evolution: Eine Tagung mit Papst Benedikt XVI. in Castel Gandolfo*. Augsburg: Sankt Ulrich Verlag.
- Hübner, Jürgen. 1966. *Theologie und biologische Entwicklungslehre: Ein Beitrag zum Gespräch zwischen Theologie und Naturwissenschaften*. München: Beck.
- . 1975. *Die Theologie Johannes Keplers zwischen Orthodoxie und Naturwissenschaft*. Beiträge zur historischen Theologie 50. Tübingen: Mohr.
- , ed. 1987. *Der Dialog zwischen Theologie und Naturwissenschaft: Ein bibliographischer Bericht*. Forschungen und Berichte der Evangelischen Studiengemeinschaft 41. München: Kaiser.
- Ijjas, Anna. 2011. *Der Alte mit dem Würfel: Ein Beitrag zur Metaphysik der Quantenmechanik*. Religion, Theologie und Naturwissenschaft / Religion, Theology, and Natural Science 24. Göttingen: Vandenhoeck & Ruprecht.
- Junker, Reinhard, and Siegfried Scherer. 2013. *Evolution: Ein kritisches Lehrbuch*. 7th ed. Weyel Biologie. Gießen: Weyel.
- Kehrer, Günter. 2014a. "Atheismus, Religion und Wissenschaft – Ein Problemfeld zu klärender Verhältnisse." *Erwägen, Wissen, Ethik* 25(1):1–12.

- . 2014b. "Konfessorischer Atheismus angesichts einer agnostischen Wissenschaft und einer substanzlosen Religion." *Erwägen, Wissen, Ethik* 25(1):176–97.
- Körtner, Ulrich H. J. 1995. *The End of the World: A Theological Interpretation*. Louisville, KY: Westminster John Knox Press.
- . 1997. *Solange die Erde steht: Schöpfungsglaube in der Risikogesellschaft*. Mensch, Natur, Technik 2. Hannover: Lutherisches Verlags-Haus.
- . 2007. *Schöpfung und Evolution - zwischen Sein und Design: Neuer Streit um die Evolutionstheorie*. Wien, Köln, Weimar: Böhlau.
- . 2013. "„Schöpfung“ und „Evolution“: quasi dasselbe mit anderen Worten? Zur Hermeneutik des Dialogs zwischen Theologie und Naturwissenschaft." In *Evolutionstheorie und Schöpfungsglaube: Neue Perspektiven der Debatte*, ed. Hubert Ph. Weber and Rudolf Langthaler, 119–44. Göttingen: V & R Unipress.
- Kummer, Christian. 2009a. *Der Fall Darwin: Evolutionstheorie contra Schöpfungsglaube*. München: Pattloch.
- . 2009b. *Was ist Naturphilosophie und was kann sie leisten?* Alber-Philosophie. Freiburg, München: Alber.
- Küng, Hans. 2006. *Der Anfang aller Dinge: Naturwissenschaft und Religion*. 9th ed. München, Zürich: Piper.
- Kutschera, Ulrich, and Andreas Beyer, eds. 2007. *Kreationismus in Deutschland: Fakten und Analysen*. Science and religion - Naturwissenschaft und Glaube 1. Berlin, Münster: Lit.
- Link, Christian. 1982. *Die Welt als Gleichnis: Studien zum Problem der natürlichen Theologie*. 2nd ed. Beiträge zur evangelischen Theologie 73. München: Chr. Kaiser Verlag.
- . 1991a. *Schöpfung: Schöpfungstheologie in reformatorischer Tradition*. Handbuch systematischer Theologie 7/1. Gütersloh: Mohn
- . 1991b. *Schöpfung: Schöpfungstheologie angesichts der Herausforderungen des 20. Jahrhunderts*. Handbuch systematischer Theologie 7/2. Gütersloh: Mohn
- . 2012. *Schöpfung: Ein theologischer Entwurf im Gegenüber von Naturwissenschaft und Ökologie*. Neukirchen-Vluyn: Neukirchener Verlag.
- Lindbeck, George A. 1984. *The Nature of Doctrine: Religion and Theology in a Postliberal Age*. Philadelphia: Westminster Press.
- Losch, Andreas. 2011. *Jenseits der Konflikte: Eine konstruktiv-kritische Auseinandersetzung von Theologie und Naturwissenschaft*. Forschungen zur systematischen und ökumenischen Theologie 133. Göttingen: Vandenhoeck & Ruprecht.
- Maurin, Krzysztof, Krzysztof Michalski, Enno Rudolph, and Georg Picht, eds. 1981. *Offene Systeme II: Logik und Zeit*. Forschungen und Berichte der Evangelischen Studiengemeinschaft 35. Stuttgart: Klett.
- McGrath, Alister E. 2001. *A Scientific Theology: Vol. 1: Nature*. Grand Rapids, Mich. Eerdmans.
- Moltmann, Jürgen. 1987. *Gott in der Schöpfung: Ökologische Schöpfungslehre*. 3rd ed. München: Kaiser.
- . 2003. *Science and Wisdom*. London: SCM Press. transl. Margaret Kohl.
- . 2005. *God in Creation: An Ecological Doctrine of Creation*. 5th ed. London: SCM Press. transl. Margaret Kohl.

- . 2011. "Is the world unfinished? On interactions between science and theology in the concepts of nature, time and the future." *Theology* 114(6):403–13.
- . 2013. "Is the World Unfinished? On Interaction Between Science and Theology in the Concept of Nature, Time, and the Future." In *Science and Religion in the Twenty-First Century*, ed. Russell Re Manning and Michael Byrne, 129–40. London: SCM Press.
- Mühling, Markus. 2014. *Resonances: Neurobiology, Evolution and Theology: Evolutionary Niche Construction, the Ecological Brain and Relational-Narrative Theology*. Religion, Theologie und Naturwissenschaft 29. Göttingen: Vandenhoeck & Ruprecht.
- Müller, A. M. Klaus. 1970. "Über philosophischen Umgang mit exakter Forschung und seine Notwendigkeit." In Müller and Pannenberg, *Erwägungen zu einer Theologie der Natur*, 1–32.
- . 1973. *Die präparierte Zeit: Der Mensch in der Krise seiner eigenen Zielsetzungen*. 2nd ed. Stuttgart: Radius-Verlag.
- Müller, A. M. Klaus, and Wolfhart Pannenberg, eds. 1970. *Erwägungen zu einer Theologie der Natur*. Gütersloh: Mohn.
- Mutschler, Hans-Dieter. 2014. *Halbierte Wirklichkeit: Warum der Materialismus die Welt nicht erklärt*. Kevelaer: Butzon & Bercker.
- Overhage, Paul, and Karl Rahner. 1961. *Das Problem der Hominisation: Über den biologischen Ursprung des Menschen*. Freiburg: Herder.
- Pannenberg, Wolfhart, Rolf Rendtorff, Trutz Rendtorff, and Ulrich Wilckens, eds. 1969. *Revelation as History* [trans. David Granskou]. London: Sheed and Ward.
- Pannenberg, Wolfhart. 1970. "Kontingenz und Naturgesetz." In Müller, A. M. Klaus and Pannenberg, *Erwägungen zu einer Theologie der Natur*, 33–80.
- . 1973. *Wissenschaftstheorie und Theologie*. Frankfurt a.M. Suhrkamp.
- . 1976a. *Grundzüge der Christologie*. 5th ed. Gütersloh: Gütersloher Verlagshaus Mohn.
- . 1976b. *Theology and the Philosophy of Science*. Philadelphia: Westminster Press.
- , ed. 1982. *Offenbarung als Geschichte*. 5th ed. Göttingen: Vandenhoeck & Ruprecht.
- . 1987. *Jesus: God and Man* [transl. Lewis L. Wilkins, Duane A. Priebe]. 2nd ed. Philadelphia: Westminster.
- . 1993. "Contingency and Natural Law." In *Toward a Theology of Nature: Essays on Science and Faith*, ed. Ted Peters, 72–122. Louisville, Ky. Westminster/John Knox Press.
- . 2001. *Systematic theology vol. 2* [transl. Geoffrey W. Bromiley]. 3rd ed. Grand Rapids, Mich.
- . 2008. *The Historicity of Nature: Essays on Science and Theology*. Edited by Niels H. Gregersen. West Conshohocken, Penn. Templeton Foundation Press.
- Peitz, Heinz-Hermann. 1998. *Kriterien des Dialogs zwischen Naturwissenschaft und Theologie: Anregungen aus dem Werk Karl Rahners*. Innsbrucker theologische Studien 53. Innsbruck, Wien: Tyrolia.
- Peters, Ted, Robert J. Russell, and Michael Welker, eds. 2002. *Resurrection: Theological and scientific assessments*. Grand Rapids, Mich. Eerdmans.
- Pickel, Gert. 2011. "Atheistischer Osten und gläubiger Westen? Pfade der Konfessionslosigkeit im innerdeutschen Vergleich." In *Religion und Religiosität im vereinigten Deutschland: Zwanzig Jahre nach dem Umbruch*, ed. Gert Pickel and Kornelia Sammet, 39–72. Wiesbaden: VS Verlag für Sozialwissenschaften.

- Rahner, Karl. 2002. *Sämtliche Werke 15: Verantwortung der Theologie im Dialog mit Naturwissenschaften und Gesellschaftstheorie*. Edited by Hans-Dieter Mutschler. Solothurn, Düsseldorf: Benziger.
- Schmitz-Moormann, Karl. 1986. *Teilhard de Chardin in der Diskussion*. Wege der Forschung 227. Darmstadt: Wissenschaftliche Buchgesellschaft.
- . 1992. "Theology in an Evolutionary Mode." *Zygon* 27(2):133–51.
- . 1996. *Pierre Teilhard de Chardin: Evolution – die Schöpfung Gottes*. Mainz: Matthias-Grünewald.
- . 1997a. *Materie – Leben - Geist: Evolution als Schöpfung Gottes*. Mainz: Matthias-Grünewald.
- . 1997b. *Theology of Creation in an Evolutionary World*. With the assistance of James F. Salmon. Cleveland, Ohio: Pilgrim Press.
- Schönborn, Christoph. 2005. "Finding Design in Nature." *New York Times*, July 7. <http://www.nytimes.com/2005/07/07/opinion/07schonborn.html>.
- Schwarz, Hans. 2012. *400 Jahre Streit um die Wahrheit - Theologie und Naturwissenschaft*. Göttingen: Vandenhoeck & Ruprecht.
- . 2014. *Vying for Truth – Theology and the Natural Sciences: From the 17th Century to the Present*. Göttingen: Vandenhoeck & Ruprecht.
- Weizsäcker, Carl F. v. 1980. *The Unity of Nature*. New York: Farrar Straus Giroux.
- . 2006. *The Structure of Physics*. Edited by Thomas Görnitz and Holger Lyre. Dordrecht: Springer Netherlands.
- Weizsäcker, Ernst U. v. 1986, ed. *Offene Systeme I*. 2nd ed. Forschungen und Berichte der Evangelischen Studiengemeinschaft 30. Stuttgart: Klett-Cotta.
- Welker, Michael. 1999. *Creation and Reality*. Minneapolis: Fortress Press.
- . 2005. *Gottes Geist: Theologie des Heiligen Geistes*. 3rd ed. Neukirchen-Vluyn: Neukirchener Verlag.
- . 2012a. *Gottes Offenbarung: Christologie*. 2nd ed. Neukirchen-Vluyn: Neukirchener Verlag.
- . 2012b. *The Theology and Science Dialogue: What can Theology Contribute?* Theologische Anstöße 3. Neukirchen-Vluyn: Neukirchener Verlag.
- . 2013. *God the revealed: Christology*. Grand Rapids, Mich. Eerdmans.
- Wohlrab-Sahr, Monika. 2002. "Religions und Religionslosigkeit: Was sieht man durch die soziologische Brille?" In *Religion als gesellschaftliches Phänomen: Soziologische theologische und literaturwissenschaftliche Annäherungen*, ed. Marianne Heimbach-Steins, 11–25. Münster, Hamburg: Lit-Verlag.