

Review of Tapp, Christian & Breitsameter, Christof (eds.) (2013), *Theologie und Naturwissenschaften (Theology and Natural Sciences)*. Berlin & Boston: De Gruyter (326 p.)

This volume presents twelve articles written by philosophers and scientists, who deal with the relation between theology (or religion) and natural sciences from different perspectives. Four articles (Harrison, Heller, Pinsent and Polkinghorne) have been originally written in English by leading promoters of the science-religion-dialogue, while the remaining articles have been written by outstanding German scholars. The book is divided into three parts, every part consisting of four articles. The first part illuminates different aspects of the relationship between science and religion in general, that is from the point of view of the philosophy of science. The other two parts focus on special sciences and on metaphysical and theological questions related to them. In particular, the second part relates to “physical and cosmological explorations” and the third part to “walks on the border in the realm of life sciences”.

Reinhold Esterbauer (philosopher at the University of Graz) in his article *Consciousness about methods* (21-37) starts with a fresh look on the four models for the interaction of science and religion worked out by Ian Barbour (conflict, independence, dialogue and integration). After having mentioned also some later modifications of the Barbour system, Esterbauer doesn't proceed to favor one of those models, but draws back to more general considerations. He argues that it isn't appropriate to divide the areas of science and theology according to different material objects, because the theological concept of creation and the concept of nature presupposed in the natural sciences refer to one and the same reality (29). However, each discipline applies different methods in approaching this reality, and neither science nor theology is able to understand all aspects of reality by its own methods properly. Therefore, Esterbauer holds that ontological naturalism is as false as theological fundamentalism (cf. 35). In conclusion, it should be the task of theology to show that not only the natural sciences but also other ways of thinking can help us to gain insights into nature and reality (37).

Peter Harrison (historian and director of the Institute for Advanced Studies in the Humanities at the University of Queensland) presents an actualized version of his article ‘*Science*’ and ‘*Religion*’. *Constructing the boundaries* (39-68), originally published in *The Journal of Religion* 86, 81-106, dealing with the history of the concepts “science” and “religion”. According to Harrison, the modern concept of “science” is an invention of the 19th century. Modern scholars of earlier centuries (as for example Boyle, Newton and Kepler) regarded themselves as dealing with natural philosophy or natural history rather than with science in the contemporary sense. Their work was often religiously motivated and mixed with religious ideas to a high degree: many of those older scholars viewed nature to be a “book of God”, and natural history has been presented as designed by an intelligent creator up to the early 19th century. Within the 19th century, however, the contemporary secular concept of science definitely emerged, according to which science has to be sharply distinguished from aesthetics, ethics and theology (46-47). The term “religion” has also undergone major changes within the age of enlightenment. Whereas in the Middle Ages religion meant faith and piety located in the heart of the faithful, in the aftermath of the Protestant Reformation a new pluralistic concept of religion emerged, according to which there exists a plurality of “religions” distinguished by certain sets of propositional clauses to which the believer gives his consent (52). However, this concept of religion remained problematic and even today there is no universal accepted definition of religion (54). Having discussed the concepts and their history, Harrison points out that we must be sensible for different possible meanings of the terms if we talk about the dialogue between science and religion. It is quite another matter to speak about the dialogue between science and scientific theology (belonging to the different religions), which in the case of modern Christian theology might be quite unproblematic, or about the dialogue between science and religion in the sense of internal faith and piety (cf. 59-63). Harrison proposes to theologians to maintain a critical distance between science and religion, such that religion and theology may continue to exercise a critical (“prophetic”) role in a society dominated by modern science (cf. 66).

Andreas Losch (theologian at the University of Bern) in his article *The paradigm of critical realism* (69-94) reflects on critical realism, which seems to be the most important point of view held by famous contemporary “scientists-theologians” such as Barbour, Peacocke and Polkinghorne, in order to place the natural sciences in a metaphysical frame that has a place to offer for religion and theology. The problem is that each author has a different concept for critical realism and also different assessments for its usefulness for the science-religion-dialogue. Losch presents the different stances, not trying to unify them. At the same time, he holds that the notion could be relevant, and so encourages further engagement in the quest to develop an appropriate paradigm of critical realism as well as to criticize it.

Winfried Löffler (theologian and philosopher at the University of Innsbruck) discusses several *Fragile demarcation formulas* between science and religion (95-120), namely *methodical naturalism* as a principle to distinguish science from religion, the *NOMA-thesis* of Stephen J. Gould (according to which science and religion have “non-overlapping magisteria”) and the *POMA-thesis* of Alister McGrath (according to which science and religion have “partially overlapping magisteria”). Löffler observes that methodical naturalism is often extended by ontological suppositions such that in turns either in metaphysical naturalism or in a hidden kind of supernaturalism (109). The NOMA-thesis, conceived by Gould in order to avoid conflict between science and theology, has also been unsatisfactory in this respect. Simple minded creationists, Löffler argues, just don't want to avoid the conflict, whereas critics of religion such as Richard Dawkins don't see an area of meaningful non-scientific teachings, and philosophers of religion often pose the question whether it is really adequate for religious teaching to be confined to such fields as morals rather than to deal with realistic metaphysics (112-114). Löffler rejects also the POMA-thesis, because this formula again enables the conflict Gould wanted to avoid (115). Löffler finally proposes to look “beyond the model of two languages and the simple conflict model” (116) in order to unify faith and science, pointing out, that religious and scientific convictions in real life are always embedded into a common frame of orientation, which can be governed by universal criteria of rationality, and in which religious convictions play the role of “beliefs about the universal frame” rather than the role of special scientific beliefs (119).

Michał Heller (cosmologist, theologian and professor of philosophy at the Pontifical University of John Paul II in Kraków) opens the second part of the book with his article *The big bang and the creation of the universe* (123-130). Heller argues for a convergence of natural science and theology regarding the creation of the world. He doesn't equate the act of creation with the big bang or the alleged singularity at the beginning of the actual phase of cosmic evolution. He holds that this singularity can be scientifically explained, therefore it shouldn't be attributed to a “God of the gaps”. According to Heller's research in the fields of quantum gravity, the singularity occurs only in the higher levels of reality, while it vanishes at the fundamental quantum level, where the classical concepts of space and time have no meaning (126), and moreover classical causality has to be replaced by a new concept of non-commutative and non-local causality (127). This fits well into the higher developed theological concept of creation, according to which creation is not primarily conceived as an event that caused the beginning of the universe, but refers to the universe as a whole and its dependence on God (127). Heller finally points to two riddles of the universe: that the universe is comprehensible (a fact that Einstein also admired), and that it is comprehensible by mathematical formulas. Therefore Heller, following Leibniz, comes to the conclusion that creation can be thought of as a mathematician's work, who endows his thoughts with reality and thereby creates the world (129). Heller sees at this point also a parallel in the Logos theology, as it is expressed in the prologue of St. John's gospel (129-130).

Markus Aspelmeyer (quantum physicist at the University of Vienna) in his article about *Quantum physics and the openness of scientific description* (131-141) wants to invite theologians to a dialogue. He emphasizes that quantum theory is incompatible with the world view based on everyday life experience. Most notably, as has been verified by experiments, it is not possible to combine “locality” (i.e. the non-existence of “action at a distance”) and “realism” (i.e. the existence of physical properties independent of

measurement). This strange features of quantum mechanics apply to microscopic objects, while quantum mechanics seems to lose its validity in the macroscopic realm, where the measurement process takes place. But, as Aspelmeyer points out, the loss of validity of quantum phenomena (called “decoherence”) results just from the fact that the physicist doesn't include the macroscopic surroundings of a quantum system in his quantum mechanical description, due to the complexity of the surroundings (138). However, for a “superobserver” (139) who is able to observe the entire system the decoherence process would be suspended, leaving the whole reality as a superposition of indiscernible states (138-139). So it is questionable whether a consistent scientific description of the totality of (physical) reality is possible after all (138). In this sense, scientific description seems to be open, which might be important for the dialogue with theologians. In particular, Aspelmeyer hints to two possible issues of this dialogue (140-141). The first is the question of theological interventionism (and free will), to which he confesses to have no answer. The second is Joseph Ratzinger's fear, that metaphysics in modern times tend to be reduced ultimately to pure physics. The openness of physical description, Aspelmeyer argues, shows clearly, that this fear is unfounded.

John Polkinghorne (British physicist and theologian) in his article *A comprehensible universe* (143-155) starts from the same fact that was also considered in Heller's article: the fact that we can comprehend the universe, and moreover, that we can comprehend it by “beautiful” mathematical formulas. This can be best explained, if we assume the existence of a God who created the universe. This is not, Polkinghorne remarks, a cogent proof of God's existence, but seems to be the best answer (i.e. the answer intellectually most satisfying) to the question why the universe is comprehensible (147). A second interesting point in Polkinghorne's article is his opinion, that God as the creator of the universe has determined only certain parameters and aims, leaving much room for a free (i.e. undetermined) development of the universe to achieve the given aims (149-151). For example, it could be that God has determined the universe to bring about intelligent life, without having also fixed from the beginning, that evolution on earth should bring about specific human beings with five fingers.

Uwe Meixner (philosopher at the University of Augsburg) closes the second part of the book with his article about *Physics and Metaphysics* (157-184). Meixner reminds us to be aware of the fact that science and metaphysics up to continue to develop themselves within history and haven't achieved yet their “final” form (159). Meixner holds, that metaphysics is a science whose propositions are not less verifiable and falsifiable than those of other sciences (cf. 168), and that its *inner thematic field* consists precisely of synthetic (as opposed to analytic) propositions that can be verified a priori and can also be falsified a priori (although, of course, not on the same grounds, and not both with cogent reasons). Meixner's example for such a proposition within the inner thematic field of metaphysics is “God exists”. There is also an *outer thematic field* of metaphysics that consists of all propositions that can be verified a priori (i.e. rationally accepted on non-empirical grounds, although those ground may be non cogent) but cannot be falsified a priori, plus all propositions that can be falsified a priori, but cannot be verified a priori. Meixner ascribes certain thematic fields also to physics: the *inner thematic field* of physics consists of synthetic propositions, for whose acceptance as well as for whose rejection empirical grounds are necessary, while the *outer thematic field* of Physics consist of synthetic propositions, for whose acceptance (but not for whose rejection) or for whose rejection (but not for whose acceptance) empirical grounds are needed (172). Using these definitions, Meixner's conclusion is that while the inner thematic fields of physics and metaphysics are entirely disjoint, the outer thematic field of physics and the outer thematic of metaphysics is one and the same (173), it is so to speak the intersection area of both disciplines. Meixner's example for a proposition that lies in this intersection area is “some microphysical event lacks a physical sufficient cause”. Based on this fundamental description of the relation between the two disciplines, there are, according to Meixner, three possible more concrete “end scenarios” for this relation, and assesses their rationality and probability.

Christian Kummer (biologist and philosopher at Munich School of Philosophy) opens with bis article *Darwin's theory – not dangerous but wonderful* (187-202) the third part of the book. Kummer rejects the

claim of Daniel Dennett, one of the most famous leaders of the “new atheist” movement, that Darwin's theory of evolution supports atheism and thus has to be regarded as “dangerous” by theists. According to Kummer, Dennett rejects final causes in nature without sufficient carefulness. Kummer himself rejects design on purpose, just as Dennett does, but thinks that there is another alternative than Dennett's recourse to unconscious mechanisms, namely the alternative of self-organization of living organisms (188). According to Kummer, the reproduction of self-organizing organisms can be viewed to be a “final cause” within the process of natural selection (191). Kummer relates this theory to the extension of the Darwinian theory by evolutionary biologist Wolfgang Friedrich Gutmann (Frankfurt), where life forms are not only metabolic systems but also “hydraulic constructions” that have an inner tendency to movement and innovation (193-199). This can be related to the existence of creator who enables proper creativity of living organisms.

Ulrich Lüke (biologist and theologian at Aachen University) reflects on *Animation* (203-238) in the sense of the achievement of a soul. He considers the relevance of the theological doctrine of the immortal soul for the biological landmark of hominization. Lüke thinks that the search for a qualitative difference between humans and animals has failed (206). So there remain only quantitative differences: humans use and produce tools, and they propagate informations through language, but certain animals have these skills also to a certain degree. As to the criterion of self-consciousness, Lüke holds that this might be a valid “Rubicon” landmark, separating humanity from animals, only if it is extended to a consciousness of transcendence involving religious acts (221). Thus, according to Lüke, the word “soul” should be used as a cipher for the mutual communication between God and man and for the god-given dignity of man (235). The soul, seen as the capability to communicate with God, seems to have emerged gradually in the phylogenetic process (first traces of this capability can be attributed already to *Homo erectus*). On the other hand Lüke criticizes the view that religion is only explained as an element of a “hyper theory” of evolutionary biology (228), whereby religion is reduced to its functional aspects in society (230-232). Thus he recognizes that the aforementioned concept of soul must be extended, if it is applied to the individual human being, where the individual soul also refers to the uniqueness of the individual, the fundamental equality of all men and the mystery that every individual human being is and remains (237).

Andrew Pinsent (physicist, theologian, and research director of the Ian Ramsey Centre for Science and Religion at Oxford University) deals with *The second person perspective in science and theology* (239-254), and draws some interesting parallels and mutual connections between scientific research in experimental psychology (especially research concerning the phenomenon of autism) and discussions in theology and philosophy about the concept of a person. As the exploration of autism has shown, it is very difficult for autistic people to share the perspective of a second person: the ability of autistics for “joint attention” with another person and their “second-personal sense” is lacking or weakened, such that they use the word “you” often in reference to themselves (242-243). Here, in Pinsent's view, we can appreciate the importance of the inherent relational structure of the concept of a “person”. That personhood involves the relation to other persons has been made clear by Martin Buber in the early 20th century (244-245), but insight in the relational structure of personhood has also been present in the theological tradition of Christianity, where it served to explicate the most fundamental Christian dogmas about the Trinity and the Incarnation (245-246). It can also be found, at least indirectly, in texts of St. Augustine and Thomas Aquinas. Following his interpretation of Aquinas' moral doctrine about the moral virtues and spiritual gifts (“*dona*”), Pinsent points out that it is essential for the believer to have a “joint attention” with God, the ability to see things from God's perspective. The lack of such an ability seems to be a kind of “spiritual autism” (250, 253).

Hans Kessler (emeritus professor of fundamental theology in Frankfurt) finally discusses in his article *The contest about reality* (255-293) the “quest about God” challenged by an “atheism grounded on natural science”. Kessler concedes that Charles Darwin's theory of evolution is the foundation of modern biology and is able to account for the purposeful features found in nature without using teleological explanations. However, a mere functional scientific explanation of the world isn't complete, as Kessler clarifies by

considering the lighting a log fire in everyday life (261): if we try to explain such acts from all sides, non-scientific aspects also must be taken into account. Following Wolfgang Pauli and Heisenberg, Kessler believes that reality is multi-dimensional and therefore requires different and complementary explanations (262-266). In order to show that non-scientific explanations are necessary, Kessler argues that scientific naturalism cannot account for the problem of qualia and the irreducibility of the first-person-perspective, and, most notably, that natural science isn't able to reflect properly about purpose, sense and reality as a whole (267-270). On the other hand, religions try to give meaningful non-scientific answers relating to the overall sense of reality. Turning to the quest for God, Kessler starts with the fact that many people have "metaphysical et existential desires" (271) as for example the longing for an ultimate meaning, which would be difficult to explain when the object of this desire wouldn't exist. This line of thought has some force for the believer, but isn't, in Kessler's view, a full-blown proof of God's existence. Atheism and theism are two possible options regarding the question whether an ultimate meaning or ground of reality exists. Neither theism nor atheism can rigorously be proofed to be true, but both options should be accepted only based on good rational reasons (272-273). Kessler goes on to consider the arguments for accepting a divine ground of the universe and maintains that such a ground doesn't presuppose that the universe had a beginning in time, and in any case, it is important that people ask questions transcending the totality of the world (285). Finally, among other points, the evolution of human life, being a process full of extreme improbabilities, as is shown for example by the so called "fine tuning" of several (at least thirty-seven) constants in cosmology to enable life und human existence in the universe (286, cf. 278), leads Kessler to the conclusion that our scientific insights may appear more stringent if we presuppose God's existence than if we don't (286). Taking into account also the problem of theodicy (287-293), Kessler resumes that the serious endeavor to believe in God seems to be (as much as serious atheism) a sustainable option on good grounds, and he poses the question whether it may not even be the better option with respect to its openness for all aspects of reality, including the insights of natural sciences (293).

Seen as a whole, the volume offers precious insights in different actual debates of the science-religion-dialogue.