


Article

Dialogue Between Theology and Science: Present Challenges and Future Perspectives

Giuseppe Tanzella-Nitti ^{1,2} 

¹ School of Theology and DISF Research Center, Pontifical University of the Holy Cross, 00197 Rome, Italy; tanzella@pusc.it

² Vatican Observatory, 00120 Vatican City, Vatican City State

Abstract: In order to consider the natural sciences as a contemporary locus theologicus, I here examine the meaning and implications of the “dialogue between theology and the sciences”. Although widely used, this expression has different meanings. I try to clarify who the interlocutors of the dialogue are, where the dialogue takes place, and what the goals of the dialogue itself are. A coherent agenda to encourage the use of the sciences in theological work should include (a) the design and implementation of interdisciplinary curricula to help those scholars who are seriously interested to be trained in this field; (b) an emphasis on the role of philosophy and philosophical sources in the study of the sciences and theology; (c) going beyond the epistemological level and developing the dialogue also at the anthropological level; (d) the identification of a number of key issues for theological and religious studies that are expected to become more urgent in the coming years. Finally, the use of the sciences as a locus theologicus is expected to bear two main fruits: first, to offer a positive, speculative insight to the work of theologians and, second, to contribute to a responsible development of the dogmatic teachings of the Church.

Keywords: science and theology dialogue; interdisciplinary curricula; theology of nature; philosophical dimensions of scientific activity; scientific humanism; dogmatic development of Church’s teachings



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1. Introduction

If we recall the typology proposed some years ago by Ian Barbour as “ways of relating science and religion” (Barbour 1997; originally presented in Russell et al. 1988; see also Laracy 2023), consisting of the four views of “conflict” (scientific materialism, biblical literalism), “independence” (contrasting methods, different languages), “dialogue” (boundary issues, methodological parallels), and “integration” (theology of nature, systematic synthesis), we should place the program of using the natural sciences as a contemporary locus theologicus in the fourth and last of his views. This means to have overcome views of conflict and independence and to have gone through the experience of dialogue. The manner in which such an experience is conducted, the results it produces, and, above all, the content and methods it brings to bear, will in large part determine the outcome of those programs that Barbour puts under the label of “integration”. If the dialogue is limited to clarifying misunderstandings and pointing out the exegesis to be adopted in science or theology, or if it remains at the level of public debate that oscillates between apologetic and mystical tones, then it is unlikely to produce serious work for the academy.

If we look at the books or essays published since the 1980s and devoted to the so-called “science and religion dialogue”, most of them, especially in continental Europe, are intended for the general public; usually, they do not treat the subjects under investigation with the same depth we find in other interdisciplinary subjects. The main purpose of these essays, which are often presented under the heading “Science and Faith” or “Science and Religion”, is to emphasize the compatibility and harmonious coexistence of the two perspectives, the scientific and the religious, with arguments that most of the public may find convincing,

but that more qualified readers would still consider insufficient. In these works, the terms religion, theology, faith, spiritual life, are often used as synonyms. Generally speaking, with a few exceptions, they are all similar to each other, differing only in the biography of their authors.

Works and studies aimed at developing such a “dialogue” in a propaedeutic way for possible subsequent programs of “integration” are more common in the US and the UK, but still few in continental Europe. There are attempts to present a possible “theology of nature” and use scientific findings to argue about a dogmatic development of the teachings of the Church. For an exhaustive review of the dialogue between theology and the sciences, please refer to the work by [Perry and Leidenhag \(2023\)](#). A concise but insightful overview was provided about 20 years ago by Robert [Russell \(2002\)](#). To be propaedeutic for a later integration program, the dialogue needs a terminological rigor, a good knowledge of both scientific and theological sources, and a good familiarity with the history of philosophy. Usually, these qualities are poorly represented in works whose purpose is merely to demonstrate the compatibility of the two perspectives. By the way, those authors who support the “conflict” thesis do not write essays under a specific label (conflict or dialogue), but use them to publish popular science books presenting chapters or pages strongly critical of the theological or religious perspective.

The transition from the view of “dialogue” to that of “integration” is not trivial. If dialogue is carried out in a superficial or hesitant way, favoring only a conservative mindset without opening horizons, integration easily appears as an overly complex, even dangerous program. The temptation arises, then, to return to the safer vision of “separation” without conflict. For this reason, I propose in these pages to take a closer look at the situation of the contemporary dialogue between science and theology: Where is it taking place? What are its main trends? How are its main issues being addressed? In fact, a better knowledge of what the dialogue consists of, and how it is undertaken, can prepare the ground for the development of a “science-engaged theology” ([Perry and Leidenhag 2023](#); [Moltmann 2003](#)) and for the use of the natural sciences in the work of theologians ([Austin 1976](#); [Messer 2020](#); [Tanzella-Nitti 2009a](#)), that is, for a view in which scientific knowledge of nature can play the role of a locus theologicus.

This approach would be fully consistent with a perspective that Christian theology had in mind when it considered nature, that is, creation, as a conceptual site from which speculative or moral reflections could emerge. This perspective was adopted by Church Fathers such as Ambrose of Milan, Basil of Caesarea, Gregory of Nyssa, Augustine of Hippo, and Maximus the Confessor, to name a few. We find it in Medieval authors such as Hildegard of Bingen, Francis of Assisi and Bonaventure of Bagnoregio, and it enters the Renaissance with several Christian authors, although mixed with other forms of spirituality. With the beginning of the Modern Age, when the concept of nature was transformed into the new concept of the “scientific knowledge of nature”, this locus theologicus was gradually lost. It was thought that nature, precisely as an object of scientific knowledge, could no longer support the task of being examined by theologians. Nature could continue to be an object of interest for theology only if mediated by perspectives different from science: poetry, literature, arts, humanities. One of the tasks of theology in the 21st century should therefore be to return to the study of nature both as an object of scientific knowledge and as an effect of God’s creation. In short, *memento naturam*, that is, “remember Nature”, as [Perry and Leidenhag \(2023, pp. 1–2\)](#) cleverly suggest. This transversal and stereoscopic vision, capable of enriching both disciplines, could lead the natural sciences to become once again a theological locus for our scientific age.

2. Places, Subjects, and Aims of the Dialogue

Scholars who want to approach the subject of how theology and the natural sciences enter into dialogue should consider and examine the following:

- (a) who are the interlocutors of the dialogue;
- (b) what are the places where the dialogue is developed; and

(c) what are the actual goals of the dialogue itself.

These clarifications may seem obvious, but they are often glossed over or taken for granted, creating some confusion and bringing the whole issue back into too general, at times superficial, terms.

Consider, for example, how science and theology interact differently in a Religious Studies classroom or in a School of Theology than they do in the mass media or in public debates. Interviews, papers, and conversations have different weight and depth depending on who the author is and what his or her background and profile is. Topics concerning science and theology will be approached differently by an author who is a believing scientist (who usually has never studied philosophy or theology); an “ordained scientist”, i.e., a priest who is active in the field of science but has never received a Ph.D. or other advanced degree in theology; a professional theologian who is interested in science but has no specific expertise in any scientific discipline; or, finally, a scholar who has a double Ph.D., one in science and one in a theological discipline.

Again, all this seems obvious to people who work in the academy and are accustomed to critically reflect on what they read and hear, yet these differences are usually overlooked by many media operators and not a few popularizers of science. So there are tacit interactions that affect the whole thing; a professional theologian, for example, who is not trained in science may know scientific theories and results through the lens of popular literature or public debate, and only in a few cases may be able to understand more deeply what a scientific theory really says. I offer a course on science and theology at my university; when the course begins, many students—including future theologians—tell me that this subject is hardly relevant to them, because the vast majority of scientists around the world are atheists. This is an example of how a superficial, mass-media view influences the academy.

Let us now focus on the places of dialogue. In the Anglo-Saxon context, there are state or non-confessional university campuses that host chairs of theological studies, and even chairs of religion and science, as in Germany, the United Kingdom, and the United States. This is not the case in Latin countries such as Italy, France, or Spain, to name but a few. In the latter countries the academic dialogue between science and theology can only take place in the Ecclesiastical Universities, where theology is present; on the other hand, these universities do not have any school of natural sciences. In Latin countries, the interdisciplinary dialogue takes place in intellectual circles outside the academy, such as independent schools, institutes, or associations. As a consequence, recommendations and proposals addressed to English or North American universities cannot easily be put into practice in Italian, French, or Spanish universities.

Recent official documents addressed by Pope Francis to the Pontifical and Ecclesiastical Universities contain new and interesting recommendations for the development of interdisciplinary studies, including topics related to science and religion (Francis 2018, *proemio*). John Paul II strongly encouraged interdisciplinary studies and dedicated many allocutions and writings to both theologians and scientists (John Paul 1988; Russell et al. 1990; Strumia 1987), especially during the General Assemblies of the Pontifical Academy of Sciences (Pontifical Academy of Sciences 2003; Sánchez Sorondo 2009). The Vatican Council II (1965), which spoke of the “signs of the times” with reference to the values contained in contemporary culture (see *Gaudium et spes*, nn. 4, 11), also encouraged Ecclesiastical Universities (especially theological schools) to collaborate with all the other universities, motivating theologians and the faithful to be informed about scientific results: “May the faithful, therefore, live in very close union with the other men of their time and may they strive to understand perfectly their way of thinking and judging, as expressed in their culture. Let them blend new sciences and theories and the understanding of the most recent discoveries with Christian morality and the teaching of Christian doctrine, so that their religious culture and morality may keep pace with scientific knowledge and with the constantly progressing technology”. (*Gaudium et spes*, n. 62; see also see *Gaudium et spes*, nn. 44; *Optatam totius*, nn. 13, 15; *Gravissimum educationis*, nn. 10–12).

The way in which the relationship between science and theology is explained and perceived by the public also depends on the goals that motivate the debate engaged. The same author may write a book to reply to an attack on Christianity issued by an atheist scientist (Haught 2008) or, instead, to explain how the natural sciences can improve the work of theology (Haught 1999). Books on Genesis 1 that aim to demonstrate the compatibility of creation and evolution may give too narrow an idea of the “theology of creation” since they do not comment on the rich theology of the Logos and its implications for understanding physical reality. Essays aiming at discussing the Catholic Church’s view on bioethics could only cite a few specific documents of the Church’s Magisterium, which alone cannot give a complete idea of how the Roman Catholic Church sees and judges the work of science.

On this last point, I would like to add that the ethical issues and debates raised by the social implications of technology are generally not the best place for a serene dialogue between science and theology, simply because, in such a context, science is seen mainly as a “source of problems”. A few years ago, in a bookstore, I opened an anthology of documents of the Church’s Magisterium and looked at the index of subjects; the only entry related to the topic of “science” was “science, limits of”. Actually, the anthology contained many documents that had a positive view of the work of science, but the idea that science is something dangerous and should be limited is still commonplace in not a few ecclesiastical circles.

What if we consider authors who are active in the academy? It seems to me that the goals of the dialogue between theology and science, even when promoted by scholars, are first and foremost to correctly address boundary issues and hot topics. Few scholars are interested in broader and more challenging goals, such as building a new a unity of knowledge capable of integrating scientific and humanistic perspectives (McLeish 2019; Nicolescu 2002; Slattery 2020; Kaiser 2021). Most of the interdisciplinary literature aims at clarifying errors and misunderstandings regarding some typical hot-button issues, such as the exegesis of Genesis 1; the creation versus evolution debate; ex nihilo creation of the cosmos versus origin from a quantum vacuum; and finality in nature versus utter chance, etc. Much effort is made to separate scientific and theological perspectives, to define territories, to recall the different scopes of science and theology. A widespread approach is to describe what theology and science could say about the beginning of the universe, the origin of life, the ultimate scenarios of the cosmos, the post-human and trans-human future of *Homo sapiens*, and so on.

Nevertheless, the Academy and a number of institutions and societies seriously engaged in the dialogue between science and theology have also promoted studies on deeper theological questions, which are more difficult to address because they require not only some necessary epistemological clarifications but also and above all a higher level of conceptual synthesis. Among these questions, we certainly have the following: how to understand divine action in nature; what is the relationship between the history of the cosmos and the history of salvation; what is the religious heritage of *Homo sapiens*; how to explain the cosmic centrality of the incarnate Word-Logos in an extraterrestrial cosmological context; how to reconcile divine Providence and miracles with the scandal of physical evil; what the theological doctrine on a new creation has to say to physical cosmology. Many of these “higher level questions” were already mentioned in John Paul II’s letter to George Coyne, dated on 1 June 1988. It is not by chance that one of the most serious attempts to work on science and theology was born precisely in this historical and cultural context, giving rise to the well-known Vatican-CTNS Conference series on *Scientific Perspectives on Divine Action* (Russell et al. 2008). It is in this same climate that a good number of scholars decided to undertake the program to promote unprecedented Encyclopedias and collective works, which began to be published just at the turn of the millennium (Tanzella-Nitti and Strumia 2002; Van Huyssteen 2003; Harrison 2010; Stump and Padgett 2012; Runehov and Oviedo 2013).

The remarks I have made about themes, places, and goals may, I think, prove useful in framing a reflection on the past and present of the dialogue between science and theology.

In the following sections, I will offer, in a rather schematic way, a number of suggestions that might inspire the future work to be made, with some emphasis on Catholic theology. In doing so, I have in mind a dialogue whose interlocutors are scholars and intellectuals, a dialogue that should take place in the academy, and whose goals are to provide a better science and a better theology.

The essentials of my proposal for the work to be done can be summarized as follows:

- Design and implement specific interdisciplinary curricula;
- Improve the teaching of philosophy and enrich the philosophical sources used in the “science and theology” studies;
- Work to upgrade the dialogue from the epistemological to the anthropological level;
- Highlight a number of key issues for the agenda of theologians that are expected to become more urgent in the coming years;
- Allow the natural sciences to offer theology a positive, speculative insight and, consequently, to contribute to a responsible development of the Church’s dogmatic teaching.

3. Designing Interdisciplinary Curricula: The Need for University Programs on Science, Philosophy, and Theology

All scholars interested in the dialogue between science and theology—I would say all scholars sensitive to the ideal of a cultured person—share the wish that graduate and undergraduate curricula should have a broader interdisciplinary breath. As is well known, US universities allow more flexibility in the construction of a personal program of study than do European institutional programs. In general, the need to introduce historical and philosophical perspectives into the training of scientists is more vivid and urgent today than in the past. The situation is well presented in an article entitled “Why Science Needs Philosophy” (without a question mark at the end), written by a group of top scientists, including the renowned Italian quantum physicist and bestselling author Carlo Rovelli (Laplane et al. 2019). While offering an interesting set of guidelines to foster philosophically engaged scientific research, the authors declare “The reconnection between philosophy and science is both highly desirable and more realizable in practice than suggested by the decades of estrangement between them” (Laplane et al. 2019, p. 3951).

Regarding the need for a dialogue between science and philosophy, it should be mentioned that several decades ago some authors proposed a new approach called “philosophy in science”, which should be developed alongside an already existing “philosophy of science”. While the former is concerned with the critical evaluation, from outside, of the knowledge associated with the scientific method, the latter seeks to highlight the philosophical reflections that arise from within scientific or technological activity (see Heller 2019; Polak 2023). In the 1980s, this perspective gave rise to the journals *Philosophy in Science*, published in Tucson, AZ, and *Zagadnienia Filozoficzne w Nauce*, published in Krakow, and promoted by scholars such as Andrzej Pacholczyk, Michael Heller, Joseph Życiński, and William Stoeger.

Promoting dialogue between the humanistic and scientific disciplines in our university curricula provides a fertile humus in which a dialogue between science and theology can later develop and bear fruit. Only scholars who study the history of ideas, who are aware of the influence of a particular philosophical view of nature on the formulation of a physical theory, who recognize how a researcher’s personal biography can impact on his or her scientific program, will be better prepared to work on issues at the intersection of the sciences, philosophy, and theology (Allen and Marcacci 2024). In fact, only a better acquaintance with the historical, philosophical, and even sociological context of scientific activity can lead scientists to appreciate the role that a particular theological worldview may have played in the study of nature.

In principle, the best work on topics that concern scientific culture and Christian theology should be done by those scholars who have a double academic degree in a scientific and a humanistic discipline. For this reason, during the preparation of the Interdisciplinary Encyclopedia, directed by Alberto Strumia and myself, we required that

at least 60% of the contributors meet this requirement. The same requirement is active today in its online version in progress (*Interdisciplinary Encyclopedia of Religion and Science*). Although demanding, this requirement remains a relevant aspect for the future of the dialogue; if we look at the list of articles published in the main journals on science and religion, authors with a double advanced academic degree in both science and theology remain today a minority.

So, an interdisciplinary perspective is certainly useful for future men and women of science attending a university program. What about the interdisciplinary formation of candidates for theological studies? According to a long tradition, the teaching of the natural sciences was part of the study programs of the ecclesiastical seminaries and pontifical universities of the 18th and 19th centuries. Since the 20th century, the situation has changed dramatically, and training in the natural sciences is no longer present in the formation of the clergy. Unlike the *ratio studiorum* of the seminaries of the 19th century—which included the teaching of physics, astronomy, chemistry, botany, mathematics, and logic—the contemporary study programs of theology students cannot include such kind of disciplines due to the enormous development that scientific research has experienced in our time. The familiarity with the sciences that the clergy had in previous centuries seems to have been lost.

For those who love data, quantitative evidence of such a change is provided by the biographical profiles contained in the monumental 16-vol. *Dictionary of Scientific Biographies*, edited by Gillispie (1980). It turns out that in the 18th century, the percentage of scientists who were also clergymen of Christian churches was about 30% of all recorded biographies. This percentage drops sharply to 10% in the early 19th century, before dropping to very few profiles in the 20th century. Although these data do not prove the “efficiency” of the dialogue between theology and science—the biographies refer only to scientists who were also clergymen, but not necessarily theologians—they do provide an important indication; a significant number of scholars, initially trained in philosophy and theology, later decided to devote themselves to do research in some field of science. Nowadays, especially in Latin countries, the clergy’s knowledge of the natural sciences is quite deficient. For this reason, I think, funding programs aimed at strengthening the scientific culture of the clergy, such as those promoted by the John Templeton Foundation, are most welcome.

Usually, at least in continental Europe, the vast majority of students of theology—and then the majority of future theologians—come from the clergy. At present, lay people involved in theological study and research are a large minority. Now, the official curricula approved by the Dicastery for Culture and Education of the Catholic Church for theological schools and seminaries around the world make it difficult to introduce new disciplines and new courses in the Bachelor of Theology (BA) programs. In fact, this is the only university degree held by 90% of the Catholic clergy. In the specialized graduate programs (MA), there is, in principle, room for the introduction of interdisciplinary courses and some basic instruction in the natural sciences. Designing and implementing such programs, however, requires a certain sensitivity to the sciences, as well as a proper appreciation of the epistemological value of scientific knowledge. Typically, theologians who wish to have some training in the sciences must enroll in a new university curriculum, choosing a program in physics, chemistry, or some of the natural sciences, which takes several years. And this is a cultural investment difficult to realize for priests engaged in pastoral work. The majority of clerics or seminarians who wish to enrich their scientific culture must do so on their own, usually by reading popular scientific literature or attending lectures promoted by cultural Institutes or Associations.

What was recommended by the Vatican Council II and encouraged by various Popes regarding the dialogue between scientific culture and theology has not yet been put into practice in the majority of the educational institutions of the Catholic Church. In my opinion, one of the greatest tasks in the coming decades for the “Science and Theology Movement”—to name it in some way—will be to translate these moral encouragements and desires into a practical renewal of theological studies, introducing a better knowledge

of science into the Church's seminaries and ecclesiastical universities. To achieve this goal, a roadmap to pursue could be as follows:

In the next decades of the 21st century, we should gradually develop for the natural sciences what theological studies developed for the humanities in the 20th century, when they included in their programs new subjects such as history, psychology, philology, anthropology, or sociology. Specialized graduate studies in theology (MA) should include courses on "Science and Theology", for instance, presenting more in depth a number of topics under public debate, or developing a historical, philosophical, or epistemological perspective on the relationship between these two fields. Ph.D. dissertations on topics at the intersection of science, philosophy, and theology should also be encouraged. Last but not least, it is important to improve the scientific level of studies on science and theology and to raise the academic prestige of those scholars who choose to work in this dialogue. The depth of the peer review process required for publication should also become more demanding. In this way, the fruits of the studies carried out in this field—books, journals, associations, conferences, study groups, etc.—will be able to reach the Academy (I use a capital A here) without being confined to the narrow circles in which they originate.

In my opinion, the role of ecclesiastical theological schools, especially in the Catholic environment, remains strategic. In fact, the focus on *science and religion studies* adopted by the theological schools promoted by the Churches born of the Reformation is too general for *theology* to return to using nature as a locus theologicus and the natural sciences as a positive resource for the theologian's theoretical activity. Theology is not religion.

4. How to Improve Philosophy's Propaedeutic Role in "Science and Theology" Studies?

A number of factors seem to have weakened the propaedeutic and mediating role that philosophy is expected to play when the scientific community confronts the big questions raised by the natural sciences and proposes them to the general public. I would like to mention here three factors that seem to have had some weight.

- (a) Ultimate questions about "the origins", man's place in the cosmos, and the meaning of it all, are now raised primarily by scientists. In contrast to Modernity, contemporary philosophy seems to have dismissed them. As a result, these questions are addressed and framed essentially within the scientist's personal and existential worldview, and much less within a more universal, historical, and philosophical context.
- (b) Since the second half of the 20th century, philosophy of science has become more skeptical about the possibility of knowing the truth (truth in science and truth in general). The reading of scientific works made by philosophers prompted science to abandon a realist framework in favor of an idealist or conventionalist one. As a result, a large number of scientists, who used to be genetically realist in their approach to the physical phenomena, have given up on dialogue with philosophers. Sometimes, scientists have the impression that philosophers are abstract intellectuals who do not have enough understanding of experimental research work.
- (c) Finally, many of the big questions raised by the natural sciences have directly or indirectly introduced a notion of *God*. The first context into which scientists have brought the "science and God debate" was sacred Scripture, not philosophy. As a result, the discussion between science and theology began to revolve around biblical exegesis, making the need for recourse to philosophy less obvious.

This state of affairs led many scientists to create "their own" philosophy. This was done on the basis of their feelings and experiences, in accordance with the materialistic or spiritual attitude they had developed in their youth. Only few scientific researchers have been introduced to the great philosophical traditions used to discuss being and becoming, causality and contingency, language and its interpretation, chance and finality, life and death. For the majority of them, many philosophical tools remain abstract, unfamiliar concepts. A number of philosophical concepts—being, truth, chance, finality, etc.—have been interpreted as merely empirical concepts and transformed into quantitative properties

of matter, energy, and space-time, into probabilities to be calculated, or into formal logic to be written down.

A certain difficulty in reasoning in terms of metaphysical ontology, and thus a certain difficulty in understanding the action of a causality that is transcendent with respect to space and time, has led some scientists to present arguments at the intersection of science and philosophy without concern for maintaining sufficient epistemological and metaphysical rigor. The need for adequate philosophical depth becomes even greater when the interdisciplinary debate is to include the concept of God. The number of popular science books that contain the term “God” in their title is now so great that it would be pointless to give a bibliographic listing of them here. Indeed, there are different philosophical images of God, not all of which are equivalent. Knowledge of the origin and meaning of these images becomes indispensable when the confrontation between science, philosophy, and theology is carried out on the theological or biblical terrain. Many misunderstandings and conflicting views of the relationship between God and nature result from a failure to define which philosophical image of God a particular author is referring to. A recent example is the widespread debate surrounding a best-selling book on God and Science (Bolloré and Bonnassies 2021; Rovelli and Tanzella-Nitti 2024; Sánchez Cañizares 2024).

For all these reasons, I believe that the development of the dialogue between theology and the sciences, including that which should lead to a re-evaluation of the knowledge of nature as an appropriate theological locus for the elaboration of a better theology, one suitable for our times, depends and will depend in the future on the depth of interdisciplinary philosophical studies. Philosophy has always been an attractive meeting point between the sciences and theology. A program to be pursued with determination, then, is to arouse the interest of scientists (and theologians too!) in the study of great philosophers and great philosophical problems. They must be known more in depth, without being content to have only an approximate view of it.

The discussion thus shifts to the philosophical sources and to the authors who deserve to be studied, a topic on which I would like to say a few more words. If in the 20th and 21st centuries a significant part of the philosophy of nature and the philosophy of science has perhaps not offered an adequate mediation for the dialogue between science and theology, then it is reasonable to look for this mediation in some authors of the past. This should not be surprising, since our current sophisticated and theoretical scientific frameworks can also be understood and interpreted in terms of philosophical, logical, and aesthetic dimensions that belong to meta-physical views already suggested in earlier times.

Among the authors of the past who could still offer some valuable insights, I would like to mention Aristotle and Thomas Aquinas. The majority of scholars involved in the dialogue between science and theology consider Aristotle to be a philosopher who is no longer relevant because his physics has been far surpassed. In reality, a better knowledge of the context of Aristotle’s thought, combined with a proper hermeneutic, could enable us to make more use of his thought. His doctrine of causation, the notion of formal causality, the composition of reality in terms of potency and act, matter and form, as well as his deep philosophy of being, are all topics that still provide a useful *philosophical* insight into natural phenomena. In recent decades, there has been a revival in the study of Aristotelian metaphysics and natural philosophy. This has led some authors to speak of “Aristotle’s revenge” (Feser 2018).

Aristotle’s thought on nature was enriched by a theological perspective thanks to Thomas Aquinas, who understands nature in the light of creation. Today, Aquinas’ philosophy is used in the dialogue between science and theology by a limited number of Catholic scholars, mainly in France, Spain, and Italy. There is a significant revival of Aquinas in the Dominican schools of the United States, where his writings are widely used, especially in the philosophy of nature, to frame and interpret the relationship between God and nature, God’s causality, and the causality of creatures (Tabaczek 2024). Aquinas’ metaphysics and philosophy of nature are used to discuss the philosophical foundations and the meta-empirical presuppositions of scientific knowledge of nature (Augros 2004;

Maldamé 2001b; Strumia 2007, 2009), including life (Carreño 2015, 2017). Scholars of Aquinas find his thought particularly suitable to search for a “unity of knowledge” and for demonstrating the unity that all physical reality acquires when understood in the light of creation. Inspired by Aquinas’ thought, scientific enterprise as a whole can be presented as a *naturale desiderium cognoscendi veritatis*, and then as part of the human *naturale desiderium videndi Deum*. Scientific activity, then, is a *personal* commitment to truth, a *personal* search for God (Tanzella-Nitti 2012).

However, the scholars of Thomas Aquinas face a major challenge. In his time, the causality of natural phenomena did not include emergence, complexity, non-locality, top-down causality, holistic and systemic approaches, all of which we are taught by contemporary physics and biology. To interpret and explain these new perspectives in terms of a classical doctrine of causation, as used in natural philosophy or metaphysics, requires a huge and insightful work of “translation” (Dodd 2012; Tabaczek 2021). Aquinas’ philosophy still has a good chance of dialoguing with a world that hosts these “new kinds of causes”, but it is clear that his thought cannot be used in a naïve way (Wallace 1968; Verschuuren and Koterski 2016; Tanzella-Nitti 2023).

A good way to increase the mediation of philosophy in the study of “science and theology” is to ask scholars to broaden their philosophical *sources* and admit different philosophical *methods*. Classical metaphysics and multi-layered ontology should be used as well as process philosophy. English speaking and continental European countries seem to have “their own authors” and pay less attention to other philosophical traditions. British and American scholars of the science–theology dialogue—the prominent group today—are much more familiar with the works of Karl Rahner, Paul Tillich, Wolfhart Pannenberg and Jürgen Moltmann, while theologians such as Henry de Lubac, Romano Guardini, Joseph Ratzinger, Jean Danielou, or Hans Urs von Balthasar are much less read and used. European continental scholars are more familiar with the Church Fathers (I mean other than Augustine of Hippo, who is obviously well studied by everyone) and Medieval authors such as Bonaventure of Bagnoregio or Hugh of St. Victor. A number of inspiring Renaissance and Modern philosophers, such as Nicholas of Cusa and Blaise Pascal, are used in very narrow circles, in the U.S. or in Europe. Authors belonging to the Orthodox Sophiology movement, such as Solov’ev, Bulgakov, or Florenskij, would also be very inspiring for an innovative theology of nature, but they seem to be known to only a small number of people.

There are contemporary sources and philosophers who are frequently and rightly cited by all groups of scholars involved in the science–theology dialogue—think of Pierre Teilhard de Chardin, Michael Polanyi, or Thomas Torrance—while others seem to remain somewhat in the shadows, although they would have much to say—think of Charles Sanders Peirce, Antonio Rosmini, Maurice Blondel, Henri Bergson, Jacques Maritain, Etienne Gilson, Jean Ladrière, Evandro Agazzi, or Enrico Cantore, to name but a few. A better intellectual cross-fertilization between different schools and groups of scholars would certainly bring fresh ideas and more fruits to the dialogue between science and theology.

5. From the Epistemological to the Anthropological Level: A Helpful Upgrade for the Science and Theology Dialogue

To date, most of the issues discussed in the field of science–theology studies concern the search for a correct epistemology capable of addressing in a meaningful and non-equivocal way what is proper to the scientific method and what is proper to other methods on which philosophical or theological knowledge is based. This is, of course, a preliminary and necessary work that lies at the foundation of all further dialogue. It is also part of an epistemological work to provide an accurate biblical exegesis to be used to compare the contemporary scientific worldview with a view of nature understood as God’s creation. As expected, scholars are so engaged in clarifying, explaining, separating, and highlighting the ways in which science, philosophy, and theology acquire and communicate their own knowledge. Interdisciplinary studies carried out at the epistemological level are mainly

concern with methods, sources to be used, ways of reasoning, etc., including the different ways in which conclusions and inferences can be made, e.g., causal, statistical, hypothetical, by abduction.

The aim of the epistemological moment of any interdisciplinary research is to produce unambiguous and sufficiently clear statements capable of expressing what we can affirm, with a certain degree of confidence, in one or more specific fields of knowledge. In doing so, we are in principle able to suggest (or even demonstrate) whether statements coming from different domains of knowledge can be judged as independent, compatible, consistent with, or even contradictory among themselves.

Normally, the epistemological approach focuses more on the subject's knowledge than on the *subject acting for an end*. We are interested in what he or she can actually grasp of reality, starting from sense experience and applying the laws of rigorous reasoning. In general, the world of aims, feelings, ideals, desires, intellectual passions, and ultimate goals is left aside. There have been attempts in past decades to assess the role that the subject's *personal world* might have for any kind of knowledge (Polanyi [1958] 1998, [1967] 2009; Damasio 1998). Thanks to these attempts, a new understanding of scientific knowledge is gradually emerging today, different from the idea that doing science is merely an impersonal, neutral, and totally objective activity. A symptom of this state of affairs can also be seen in the rise of the "internalism–externalism debate" within some currents in the philosophy of science (Kornblith 2001). Actually, the personal world of the subject is important whenever existential or spiritual dimensions are involved, as is to be expected in a dialogue between science and theology, since philosophical, theological, and religious world views are here presupposed and implicated.

5.1. Science as Personal Knowledge and a Fully-Engaging Activity

Several authors have pointed to specific domains in which "personal dimensions" of knowledge are at work. These include, to name just a few, subjective, implicit, and tacit aspects related to one's personal worldview (Polanyi [1967] 2009); historical, existential, and religious contexts of the scientist's activity and mind (Torrance 1984; Jaki 1987); value judgments associated with any measurement (Rudner 1953); implicit metaphysical views in representing what reality is: matter, spirit, life, ensemble of relations, etc. (Capra 1975; Penrose 1999, 2005; Smolin 1998; Rovelli 2022); and, especially when conceptualizing the universe as a whole, in cosmology (Gal-Or 1987).

To move from the epistemological to the anthropological level means to focus on the human persons who dialogue, that is, the scientist and the theologian, and to focus on *the very purpose of the dialogue*, that is, the search for truth. In this way we reintroduce the world of ultimate goals into scientific activity. Speaking of the anthropological dimensions of scientific research means that research, insofar as it is *scientific*, needs ends. It is thanks to the exercise of their personal freedom that researchers choose the goals and purposes of their investigation, plan an experiment, overcome failures, and nurture the motivations of their scientific enterprise. In Part III of his work *The Action*, first published in 1893, Maurice Blondel pointed out that, precisely because of this phenomenology, science seems "to transcend itself"; to do science we need ends, but ends are not the object of the scientific method (Blondel [1893] 2021, pp. 54–108).

To carry out a dialogue between science and theology, capable of accessing the anthropological level without remaining at the level of mere epistemological clarifications, means to study such aspects as are outlined below:

(1) The sense of wonder that scientists feel when they study nature (A. Einstein, M. Planck, H. Poincaré, P. Dirac); (2) their reverence toward the "mystery" of being (J.C. Maxwell, A. Einstein); (3) the role of intellectual passions (W. Heisenberg, M. Polanyi) and that of (4) inner and personal motivations of research (H. Poincaré, P. Duhem, F. Enriques, L. de Broglie); (5) to discuss the ultimate purposes of scientific research (T. Dobzhansky, J. Barrow, P. Davies); (6) to reflect on the "religious dimension" of scientific activity (R. Boyle, P. Teilhard de Chardin); (7) to present scientific knowledge as an integral part of human

dignity (E. Cantore, F. Barone); (8) to reflect on the social responsibility of scientists; the more they know, the more they must be at the service of all (John Paul II); (9) to underline the commitment of scientists to peace (A. Einstein, B. Russell, E. Amaldi); (10) to explore the dialogue between science and art (J. Barrow); (11) to emphasize that ultimate, existential questions arise from the *very heart* of scientific activity (P. Teilhard de Chardin, A. Einstein, P. Davies); and (12) to overcome of the “neutral” and impersonal view of technology (R. Guardini, G. Simondon).

In a few words, accessing the anthropological level means to underline that scientific activity is not foreign to the dimensions of *logos*, *ethos*, and *pathos* (Tanzella-Nitti 2009b). According to Christopher Kaiser (2021), there is enough room to systematize and develop a *Theology of Scientific Endeavour*.

For their part, theologians must also equip themselves to enter into a dialogue with scientists that includes the personalistic aspects of research. Among the theological subjects that are particularly suited to this goal, I would like to recall some that I consider strategic in this regard.

First of all, theology is called to take seriously *God’s revelation through nature*. In contemporary theology of revelation, this aspect has been almost dismissed, and it is important to keep it alive (Ganoczy 1997; Fries 1996, §§19–25; Tanzella-Nitti 2022a, pp. 121–235). Before revealing himself through a history of salvation, God gave and continues to give witness to himself as Creator of heaven and earth (Vatican Council II 1965: *Dei Verbum*, nn. 3 and 6). This has relevant consequences for the relationship between man and nature, since God’s revelation in the created world is, ultimately, the source of those feelings and experiences that many scientists encounter: contemplation, wonder, awe, reverence, prayer, beauty, rationality, intelligibility, and so on.

Second, it is important to develop a theology of the *Logos as Verbum*, not just a theology of the Logos as *ratio*. Understanding the Logos of creation (Jn 1:1–3; Heb 1:1–3) as the source of the rationality and intelligibility of the natural world is a fruitful interpretation that Christian theology has developed on the basis of biblical data, employing in part a classical Platonic perspective. However, a second relevant meaning of the Greek term *logos*, as is well known, is that of “word”, Latin *Verbum*, which emphasizes the “personal” dimension of the First Principle who created the world. Now, it is precisely this personal dimension that is responsible for what the researcher, as a human person, experiences when confronted with the natural world and its laws. Nature is the effect of a *personal word*, it conveys a silent voice that appeals to every human being, asking him or her to take a position before the mystery of the being of the cosmos, before the mystery of one’s own existence. “Others, to find God, read a book. It is a great book the very beauty of creation: look, contemplate, read the upper world and the lower world. God has not written in ink letters by which you could know him. He has placed before your eyes what He has created. Why do you seek a louder voice? Shout to you heaven and earth, ‘I am God’s work.’” (Augustine of Hippo, *Sermons*, 68, 6).

Third, in the dialogue between science and theology, the many possibilities contained in the *Eastern theological reflection on Sophiology* should be carefully explored (P. Florenskij, S. Bulgakov, V. Solov’ëv). A theology of *Sophia* is able to convey a more personalistic view of the cosmos, whose eternal ideas belong to the Trinitarian life of God Creator. Again, the theological perspectives of Logos–Verbum and Sophia, which are more personalistic in character, can counterbalance the Western perspective of Logos–Ratio, since the latter tends to emphasize the rational and logical dimensions of creation. In order to have a healthy dialogue between science and theology, we must breathe with both lungs, the lungs of the Western and the Eastern tradition.

5.2. The Program of a Scientific Humanism

In the context of the strengthening of the anthropological perspective of scientific and theological studies, I would like to briefly mention the program of a “scientific humanism”. An expression used by various authors with different meanings (M.C.

Otto, M. Shermer, M. Gorran, O.L. Reiser), I refer here to the meaning given to it by the Italian-American philosopher Enrico Cantore (1977, 2002, 2023), also present in some reflections made by Federico Enriques ([1911] 2016), Francesco Barone (1994), and Silvano Tagliagambe (2000, 2016).

According to Cantore, scientific humanism understands science as a human activity and emphasizes the *human* dimensions of scientific inquiry: creativity, imagination, philosophical presuppositions, ethical motivations, and existential and religious inspirations. These dimensions are relevant to both theoretical activity and the practice of discovery. Scientific humanism holds science to be a value in itself and an important source of dignity for all human beings. “The essential contribution of science to humanism consists in nothing less than giving to man a new awareness of himself” (Cantore 1977, p. 398). It aims to offer and communicate a correct and faithful view of science, protecting it from the risk of ideological manipulation, which more often occurs when society and public opinion support an instrumental, neutral view of scientific activity. Scientific humanism helps to avoid dangerous misinterpretations of science and to give science its true image. Science and technology, in fact, are often presented as either the solution to all of humanity’s problems and the guarantee of a happy future, or, conversely, as a threatening and dehumanizing drive that creates fear and insecurity. Scientific humanism points out that this ambiguous and ideologically clothed image of science is at the root of contemporary social, educational, and environmental crises; such a misconception of science does not help to understand the true social role of scientists, a role that authors such as John Brockman (1995) and Yuval Harari (2015, 2018) understand as leading and governing humanity with the same methods and dynamics they use in scientific work.

From a philosophical point of view, scientific humanism could contribute to the renewal of the philosophy of science by proposing to frame it in a new way, as a *philosophy of scientific activity*. Based on the fact that science is a personal activity and not a tool or a process to be analyzed, a “philosophy of scientific activity” would be more appropriate to our times. This philosophical perspective could be nourished by the classical “philosophy of action” developed by Thomas Aquinas and Maurice Blondel, and more recently by authors as Edmund Husserl and Karol Wojtyła.

Scientific humanism brings scientific activity closer to other human and philosophical experiences; science is understood as a search for truth, as part of a dialogue between man and nature, generated and nourished by reverence and wonder, capable of promoting solidarity and the common good. In a special way, scientific activity should be considered a service and a factor of human progress; it is called to promote the culture of all, to shorten distances and to free man from superstition and errors. Scientific knowledge is everyone’s right, an asset to which all people should have access. According to the view of “scientific humanism”, the gap between the human sciences and the natural sciences is reduced or even bridged. Scientific and technological progress are no longer seen as the antithesis of human values; in order to safeguard and promote all that is *human*, it is not necessary to limit or halt science, but rather *to drive science in a humanistic way*. This was the valuable insight offered a century ago by Romano Guardini ([1927] 1994) in his *Letters from Lake Como. Explorations in Technology and the Human Race*.

How might the program of scientific humanism contribute to the vision of the sciences as a possible new theological locus? It could do so underlying the moral, free dimension of scientific work. This means that in a contemporary Social Doctrine of the Church, an important role should be reserved for technical and scientific activity as part of human activity seen in the light of God’s plan for the created world (see Vatican Council II, *Gaudium et spes*, nn. 33–39). In essence, science would be a theological locus of moral theology, since every scientific and technological activity is part of the work of human beings created in the image and likeness of God. Theology, thus, finds in science a strong ally not only in the search for truth, but also in the search for and practice of the good. A clear example of that is the reflection on the many applications of an “Artificial Intelligence for Social Good”, AI4SG, as outlined by Luciano Floridi (2023, pp. 142–79).

Biblical theology could also benefit from the perspective of scientific humanism. Parallels can be traced between the character of the scientist and the profile of the wise man in the Wisdom Books of Scripture, suggesting the view of a *sapiential scientific humanism*. According to the Wisdom Books, the wise man does not know the Word of God because it is proclaimed by a prophet, but he recognizes this word present in nature; he hears it in his conscience. The wise man observes, examines, ponders, reflects, and draws conclusions from the behavior of natural elements (natural sciences) but also from the behavior of human beings (social sciences). He behaves like a man of science today.

In conclusion, by focusing on the anthropological dimensions of scientific activity, science and theology realize that they are no longer facing each other, to defend their own territory and expertise; instead, they are both on the same side, united by the common goal of promoting all that is human.

6. Some Key Questions for Future Studies in Science and Theology: Developing Ongoing Research and Expanding the Agenda

6.1. Present and Future Role of History in the Science and Theology Dialogue

Starting from Pierre Duhem's pioneering works on the role of history in the development of science, historical studies about the interactions between science, philosophy, and theology have been widely carried out throughout the 20th century by several authors. Among them are Alexander Koyré, Emil Grant, Alistair Crombie, John Brooke, Peter Harrison, and many others. Although these works have had a relatively limited circulation among the general public, they have contributed to overcome many misconceptions and oversimplifications about the interaction between Christian theology and the so-called scientific revolution. Thanks to these studies, we know today that Christian theology of creation contributed positively to the rise of the scientific method; that belief in a Creator did not endorse a mechanistic or a deterministic view of nature; and finally, that the history of the relations between science and theology was often challenged by ideological reconstructions (Numbers 2009). The work for the next decades should be to let these results have a wider outreach in public opinion, schools, and media.

In view of the above-mentioned need to develop the anthropological dimensions of the dialogue between science and theology, another fascinating task for historians would be to increase the number of studies on the characters and personalities of scientists, that is, how their belief in the divine or in a God Creator influenced the way they did science, their attitude toward nature. A few scientists have been studied in this regard, especially Isaac Newton, but also James Clerk Maxwell, Pierre Duhem, Pierre Teilhard de Chardin, and Albert Einstein. Many others, however, are still waiting to be examined more in depth: Robert Boyle, Niels Steensen, Friederich Gauss, George Cuvier, Augustine Cauchy, Henri Poincaré, and Werner Heisenberg, to name a few.

New historical studies should be also encouraged concerning the role of imagination, metaphors, and creativity in science. They would be very helpful in filling (or at least shortening) the gap between the human and the natural sciences, contributing to support the idea that it is advisable to reintroduce some humanities into science curricula. Amos Funkestein's inspiring work *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century* (Funkestein 1986) and, more recently, Tom McLeish's *The Poetry and Music of Science: Comparing Creativity in Science and Art* (McLeish 2019) offer good examples of that, marking a road to follow.

6.2. Exploring the Feasibility of a "Theology of Nature" and of a "Theology of Science"

In the coming decades, a serious attempt should be made to understand whether a "theology of nature" and a "theology of science" could be established and gradually introduced into *theological academic work*. For this to happen, these two disciplines must have a clear epistemological status and be built on solid theoretical foundations. There is room for that, as witnessed by the suggestions made by outstanding authors such as Ian Barbour (1997), Michael Heller (1996), Alexandre Ganoczy (1997), Alistair McGrath (2001),

John Haught (2007), R.J. Russell (2008), or Denis Edwards (2017). However, we need more systematic proposals, able to gain theologians' interest, not only that of scientists. Once implemented, these new disciplines will have to be truly theological in character in terms of sources and methods. Although theology of nature and theology of science will necessarily be in dialogue with the history of philosophy, they are not part of a program of philosophy (Peters 2005). On the proposal of a "theology of nature", see also the essays by Berry (2003), Case-Winters (2016), Hendry (1980), Winslow (2020), and Pannenberg (1972, 1993). Theology of nature and theology of science are not the same, although some authors use them as synonyms, when referring to nature as "nature as it is studied by the sciences". Theology of science, which began to develop in the 1980s and initially had an impact on the local Polish philosophical milieu thanks to the works of Michael Heller and Józef Życiński, should also have its own status and object (Oleksowicz 2019, 2020; Tyson 2022; Harris 2024).

A number of topics that clearly belong to a *theology of nature* are capable of establishing a fruitful dialogue with the natural sciences and suggest the natural sciences as a locus theologicus. I would like to suggest the following ones:

6.2.1. God's Revelation Through Nature

When developed by theologians, theology of revelation put much effort into discussing God's revelation through the history of salvation; it has paid less attention to explaining the way in which nature is the effect of a Word-Logos. This latter topic seems to be more frequently addressed by philosophers or even by believing scientists.

The Nature in which God manifests Himself is the *same* Nature that is the object of the analysis of science. God's revelation is part of what in the continental European tradition we call Fundamental theology, and it is then distinguished from a theology of creation properly said, which is part of a classical program of Dogmatic theology. At the intersection with a theology of nature, God's revelation in nature should be related to all kinds of knowledge that have nature as their subject. Because of its theological character, God's revelation in nature must be distinguished from (and not confused with) a "natural knowledge of God". The latter is part of a philosophical program called "natural theology" in the continental European tradition. God's revelation in nature can easily include the study of the metaphor of nature *as a book*, which is familiar to both scientists and theologians. The metaphor has a complex and fascinating historical path and deserves to be studied carefully, avoiding oversimplifications. I think it contains very inspiring suggestions for "science and theology" studies, and only a few authors and sources have been examined in depth until today.

In relation to God's manifestation in nature, in the last decades the panentheistic concept of God and His relationship to the world is gaining in importance. Authors sympathetic to this concept, such as A.N. Whitehead, Ch. Hartshorne, A. Peacocke, and J. Życiński, place their theological views in the context of the results of science. This perspective deserves an important place on the theologian's agenda as an interesting example of how the dialogue between theology and science can stimulate reflection on the Christian concept of God.

6.2.2. Creation, Information, and Finality

In relation to God's revelation in nature, and as part of a theology of the Logos, a *theological* reflection on the presence of "information" in nature should be one of the priorities on the agenda of a contemporary theologian in dialogue with the sciences. In a cosmos created in the Word-Logos, as suggested by the Judeo-Christian revelation, information can be considered an *original* component of the world and a condition for giving meaning to its evolution throughout history. A world created in the Logos possesses a positive amount of information. Along with matter and energy, information is recognized as a necessary component of the natural world. Thanks to the primordial role of information, natural entities are something *given*, they have a quidditas, i.e., specific formal properties.

The attention given by the natural sciences to the concept of information is promising for a meaningful dialogue between science, philosophy, and theology (Davies and

Gregersen 2010; Strumia 2019). Indeed, the search for the origin of information opens to the idea of personal intentionality (Krzanowski 2024); the search for the philosophical meaning of information opens to the idea of formal causality (Tanzella-Nitti 1997). Both quests provide a fruitful context for discussing the presence of finality in nature. This could also be the place for a new, more philosophically rigorous approach to the Anthropic Principle (Barrow and Tipler 1986).

6.2.3. The Natural World Between Promise and Fulfillment

Biblical theology in the first half of the 20th century interpreted creation as part of the covenant between God and humanity. While such a view has the advantage of promoting a unified understanding of the divine plan of salvation, it sometimes runs the risk of diminishing the ontological consistency of created nature as such. Indeed, the Hebrew term that Scripture uses for covenant (*berith*) also admits the meaning of oath, commitment, and promise. Seen in this light, the Word that gave rise to creation can be understood as a “promise”, and the history of creation can be understood as the unfolding of a dynamic from promise to fulfillment.

From the perspective of the natural sciences, the phenomenal appearance of the natural world and the dynamics of the many processes at work in the cosmos suggest that *nature transcends itself*. The material universe and life within it embody a “promise”. As Bergson ([1907] 2022) and Teilhard de Chardin ([1934] 1969, [1948] 2021) pointed out years ago, matter and life reveal themselves to be the subject of an ongoing evolutionary process on a cosmic scale that seems to point beyond itself. One of the most intriguing and exciting tasks of a theology of nature, then, is to reveal what this promise means, toward what fulfillment it is moving, and to show whether this information is available to all as part of God’s revelation to humanity (Ellis 2002).

6.2.4. The Christological Dimension of the Physical Cosmos

A theology of nature should explore the consequences that the world created through the Word (and in the sight of the Word made flesh) bears for the intelligibility and historicity of nature. Although the Trinitarian breath of a theology of nature should also include the role of the Holy Spirit, it is only as the Son-Logos that God the Creator has entered into history, taking upon Himself matter, space, and time (Torrance 2005). It is not surprising then that many of the themes recognized as objects of study by a theology of nature find their deeper understanding when examined in the light of the Incarnate Word.

Among the Christological dimensions of the created world in dialogue with the natural sciences, we should mention the following:

(1) Created by an intentional and personal Word, and in the sight of the Word made flesh, the whole cosmos is indeed a uni-verse, that is, its laws and physical properties must show a strong *identity* and a clear *universality*, because of the unity of its Cause and the universal extension of His power; (2) insofar as the Word is embodied (*lex Incarnationis*), we expect the primacy of *cognitive realism* and the role of induction over other possible idealistic approaches; (3) nature itself should show a clear dialogical dimension, since the word that the cosmos is was a Word sent by God to human beings; (4) since every personal Word bears a meaning and a purpose, then information is expected to be an original component of a cosmos created in the Word-Logos; (5) once understood in the light of the Word made flesh, the entire cosmic history and the evolution of life can be studied within a unified framework, something “thought out” within a single design; (6) part of this design is the presence of fragility, pain and death, which have a final and definitive unfolding in the mystery of Christ’s death and resurrection.

Among the authors who have underlined the fruitfulness of these perspectives, in a way collecting the legacy of Teilhard de Chardin, we mention Jean-Michel Maldamé (2001a), Denis Edwards (1991, 2019), Lucio Florio (2008), and Niels Gregersen (2015). A theology of nature centered on the mystery of Christ also explores the many implications

of the so-called *deep Incarnation* (Gregersen 2016; Edwards 2019) and produces reflections in the ambit of a Christian view of ecology (Deane-Drummond and Artinian Kaiser 2018).

6.2.5. To Think in Terms of a Physical History of Salvation

A pivotal task for a theology of nature in the contemporary scientific context is to begin to think in terms of what we might call “a physical history of salvation”. Unlike from the *biblical* history of salvation, a *physical* history of salvation should study, understand, and explain the history of salvation in the context of our physical universe, its space-time scales, its ongoing transformations and future scenarios. The biblical history of salvation, which focused on liberation from moral evil, sin, slavery, or from attacking enemies, so that a people could freely profess their worship of the one true God, must now be read in a cosmic context. It must also include, on some level, liberation from physical evil, ignorance, finiteness, weakness, loneliness, and death. It is a liberation that restores dignity to the role of the human being, and to life in general, in a universe no longer viewed as unfamiliar, tragic, and impersonal. A physical history of salvation must always have at its center the paschal mystery of the risen Christ, but this mystery now demands to be read with a cosmic, unprecedented breath.

Conceptually, the history of salvation—which is the history of God’s and of human freedom—has a clear priority over any evolutionary history of life and cosmos, which proceeds without the contribution of human free will. However, the former intersects with the latter; salvation takes place in the context of a physical and biological history. The realism of the Christian Incarnation—according to which the Son, when taking up human nature, also took upon Himself all relations with the created world—suggests that this intersection, with all its consequences, should be taken seriously.

A theology of nature that reflects on the physical history of salvation is expected to address the following major issues:

(1) Understand the creation of the human being in the image and likeness of the Creator God within the physical and biological historical context of the appearance of *Homo sapiens* on the planet Earth. As a consequence, understand the primitive revelation of God to human beings (both transcendental and categorical) as part of the religious heritage of *Homo sapiens*. (2) Interpret how divine Providence is consistent with the presence of physical evil in a cosmic history that includes (a) the long geological transformations experienced by our planet; (b) the struggle for survival suffered by biological species; and (c) the arduous, painful, but also extraordinary journey of the genus *Homo* until the appearance of *Homo sapiens*. (3) Place the space-time future of the cosmos and the earthly future of humankind within the theological context of a world created *in progress*, a world entrusted to the intelligent and free human cooperation with God’s plan, while the whole universe is moving towards its fulfillment in the *eschaton*. (4) Understand the uniqueness of the Christian event (Incarnation, Redemption, and Resurrection) within our extremely enlarged cosmic context.

This last issue introduces the following additional questions: How could the uniqueness of the Christian Incarnate Word hold not only on a planetary scale (religions on the Earth) but also in a cosmic context (extraterrestrial life in the universe, if any)? Does contemporary physical cosmology oblige Christian theology to relativize or diminish the significance of the Christian event? How can the earthly mystery of Christ be associated with any possible revelation of God through nature and with all the gifts of salvation that this divine revelation brings?

6.3. Dialogue on Ethics and Science

What about regarding the dialogue between science and theology in the ethical sphere? In addition to what I said earlier about the anthropological dimensions of scientific activity and the contribution that a scientific humanism can make to the social and moral progress of the international community, I would like to report here some additional insights.

Although ethical issues are perceived by the public as the most pressing—think of biotechnology, human enhancement, and AI—I suggest that we do not begin with them when we decide to develop a dialogue between theology and scientific thought. Ethical issues demand to be read and framed within an appropriate epistemology: What can we know? Can we think rationally in terms of truth, nature, ultimate ends? Can we argue about what is good or evil before knowing what is true or false? Moreover, we should discuss human nature and its ultimate ends also in light of what we know about the physical, biological, and historical evolution of human life.

An important view to convey is that once science is understood as a human, fully engaged activity, then any ethical dimension of scientific activity is somehow intrinsic to science itself. If they act honestly, without ideological constraints, scientists are capable of knowing which of their actions are good and which ones are bad. The idea of a supposed “neutrality” of science and technology should be overcome; technical skills are not neutral and impersonal “instruments” like a hammer in someone’s other hand. The technology developed by scientists is part of their personal, responsible, and *human* action. Scientific or technical action is the action of all those who apply science or technology: researchers, managers, workers, politicians, etc.

This view has a direct consequence on the way of understanding “freedom of research”. Autonomy of science and freedom of scientific research are concepts related to a *personal subject*. In fact, freedom and autonomy are the freedom and autonomy of scientists, not the freedom and autonomy of laboratories, processes, protocols, products, etc. Those who (inaccurately) refer to the autonomy of science to support and justify any research activity and any technical application seem to forget that, if freedom and autonomy belong to a personal subject, then they are inseparable from his or her specific responsibility. There can be no freedom without responsibility.

Scholars studying the relationship between science and theology in the ethical domain should remember that while ethical issues arise in the context of scientific knowledge, they more often concern the technological applications of science. These are designed and promoted for economic, marketing, and social purposes, or because they correspond to a particular view of human life, especially the way in which human health and happiness are understood. The way in which these ethical issues can be framed in a “dialogue between science and theology” depends strictly on the views of the authors, on contextual and social circumstances, and on the laws and rights that govern the relationship between religion(s) and the State in a given country. Taking all these factors into account helps to approach ethical problems as complex and embodied questions. The difficulties often encountered in ethical questions raised by science or technology depend in large part on the fact that at the root of any ethical value system is an anthropology, and at the root of any anthropology is an ontology. In short, at the basis of our view of the human beings, of his or her ultimate purposes, is that which we locate at the foundation of the being and nature of all things, whether an impersonal cosmos or the wise design of a Creator.

7. Conclusions

The academic formation and research commitment of scholars with a dual training in the natural and human sciences, the latter including religious studies and theology, is strategic for promoting a responsible and fruitful dialogue between Christian theology and contemporary scientific thought. A comprehensive dialogue is expected to include both the epistemological and the anthropological levels and to be open to an integrated, personalistic, and non-reductionist view of scientific activity.

There are two main outcomes that theological work can derive from a fruitful dialogue with the natural sciences and the knowledge of the world that they bring.

The first is to use the definite knowledge we have today about the cosmos, nature, and life as a source of positive theological speculation. This should lead to a “theology of nature”, whose epistemological status deserves to be defined more in depth. The present epoch is somewhat similar to the historical context of the Medieval universities, when

Scripture and theological reflection were brought into relationship with the various sources of knowledge gathered by the academy. A more lively dialogue with the natural sciences would lead to a significant progress in the understanding of the Word of God and in the explanation of the history of salvation to men and women characterized by scientific reason. This was the program envisaged by the Magisterium of John Paul II, which has been also encouraged by some authoritative interventions of Francis (Francis 2018), especially the Letter *Ad theologiam promovendam* (Francis 2023).

The second result of a theological encounter with the natural sciences is the possibility of a gradual and homogeneous development of the Church's dogmatic teaching, as has happened in other periods of history. In this case, the fruits of the dialogue would concern not only the work of theologians, but the authoritative teaching of the Church's Magisterium, what the faithful are called to believe. In truth, they would not be changes in what is believed, but new insights within divine Revelation, the Word of God, received once and for all. Every development of dogma is a "new" knowledge that deepens what is already known. This deepening requires a careful discernment and, in the Catholic Church, it must be carried out under the prudent guidance of the Church's Magisterium, especially that of the Ecumenical Councils.

In both cases, we move from the vision of "dialogue" to that of "integration", to recall Barbour's classification, and in both cases a scientific knowledge of nature would play the role of a locus theologicus. In the first case, we will support the use of the natural sciences in the work of theologians, as it has already been done for the human sciences; in the second case, we will improve the dogmatic and, to a certain extent, the moral teaching of the Church, as it must be presented in catechesis, in pastoral activity, and in the wide-ranging apostolate of all the believing faithful (Tanzella-Nitti 2022b, pp. 491–531).

The dialogue between science and theology is a two-way dialogue. There are things that science offers to theology and things that theology offers to the work of scientists. But there is an important distinction. While the sciences offer objective knowledge and data to the work of theologians, theology offers its contribution to scientists as *personal human beings*, as subjects of an integral experience. Theology has no data, no quantitative or measurable knowledge to offer the scientific method; rather, it brings to the scientist a vision of reality, a vision of the cosmos and of life that can enrich the intellectual gaze with which men and women of science approach the study of nature.

Science can help theologians to do a better theology, a theology that can take advantage of an improved knowledge of the natural world. Thanks to contemporary science, theology can better understand what it means *to be a creature in a created world*. Because of the contemporary scientific worldview, terms such as world, universe, nature, time, life and death, take on a weight that was unimaginable years ago. Our improved knowledge of the physical world also allows theology to learn that there is a fine-tuning in our universe, established at a very early stage of cosmic evolution, upon which the possibility of the emergence of life is based. The Christian "theology of the body" today receives new insights from the scientific knowledge that our material body has a very long cosmic and biological history, so that in a sense it summarizes the whole of creation. Contemporary cosmology has also provided an unprecedented broadening of horizons; the time between the nucleosynthesis of the first chemical elements and the appearance of life on Earth was incredibly long, as was the time between the first bipedal primates and the appearance of *Homo sapiens*. Last but not least, the question of the presence of life in the cosmos, in environments other than our solar system, remains open. It is hard to imagine that all this new knowledge will not, sooner or later, be translated into both a theological advance and a dogmatic development of the Church's doctrine.

The theological vision of a created world, a world brought into being by the love of the Creator, also brings no less important insights to the work of scientists. If nature is understood as creation, then it is intelligible and bears a meaning; it is ready to be studied inductively, and it is capable of allowing scientists to deduce universal properties from local ones. If human beings are the image and likeness of God, then we are able to understand

the Word through which creation is made; we possess a true freedom that transcends our biological nature; we have been entrusted by God with the wise stewardship of creation and are able to participate in God's creative power through our work, which includes scientific and technological progress. Theology suggests to scientists that time is *history*, that there was an origin and there will be an end. It also suggests that evolution is a meaningful process, because the physical universe embodies a Promise (with a capital P) and is moving toward a fulfillment. Finally, theology encourages scientists that there is a truth worth seeking and that scientific work is a personal, meaningful commitment to Truth (with a capital T). This is not far from what Paul Davies envisaged at the beginning of one of his most renowned books: "Science is a noble and enriching quest that helps us to make sense of the world in an objective and methodical manner. It does not deny a meaning behind existence. On the contrary. [. . .] the fact that science works, and works so well, points to something profoundly significant about the organization of the cosmos". (Davies 1992, pp. 28–29).

Looking to the future, both paths of dialogue are of paramount importance. It is certainly a challenge for theologians to incorporate scientific findings into their research and to allow them to inform their reflection. But it is no less interesting, and even provocative, for scientists to think that philosophical and theological wisdom, namely the Judeo-Christian tradition, has something to say about some relevant questions they find in their research. I am referring to that new vision of reality as a web of relationships, to that deeper understanding of matter, information, and life that contemporary science is increasingly called to embrace, to that quest for beauty and meaning that accompanies and nourishes all scientific work.

Both theologians and scientists appreciate the truthful, non-conventional dimension of scientific knowledge. Both observe their efforts with optimism, without any sense of frustration. The dialogue between them is called to explore the possible consonance that exists between the "openings" to philosophical and existential questions that science manifests and the "meanings" that theology and the Word of God offer precisely to these openings.

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References

- Allen, Paul, and Flavia Marcacci, eds. 2024. *Divined Explanations. The Theological and Philosophical Context for the Development of the Sciences (1600–2000)*. Leiden: Brill.
- Augros, Michael. 2004. Reconciling Science with Natural Philosophy. *The Thomist* 68: 105–41. [CrossRef]
- Austin, William. 1976. *The Relevance of Natural Sciences to Theology*. London: Macmillan.
- Barbour, Ian Graeme. 1997. *Religion and Science. Historical and Contemporary Issues*. San Francisco: Harper & Row.
- Barone, Francesco. 1994. Scienza e umanesimo per una nuova unità della cultura. *Nuova Civiltà Delle Macchine* 12: 9–14.
- Barrow, John, and Frank Tipler. 1986. *The Anthropic Cosmological Principle*. Oxford: Clarendon Press.
- Bergson, Henri. 2022. *Creative Evolution*. London: Taylor and Francis. First published 1907.
- Berry, Robert James. 2003. *God's Book of Works. The Theology of Nature and Natural Theology*. London: T&T Clark.
- Blondel, Maurice. 2021. *Action. Essay on a Critique of Life and a Science of Practice*. Notre Dame: University of Notre Dame Press. First published 1893.
- Bolloré, Michel-Yves, and Olivier Bonnassies. 2021. *Dieu, la science, les preuves*. Paris: Trédaniel.
- Brockman, John. 1995. *The Third Culture: Beyond the Scientific Revolution*. New York: Simon and Schuster.
- Cantore, Enrico. 1977. *Scientific Man. The Humanistic Significance of Science*. New York: IHS Institute.
- Cantore, Enrico. 2002. Umanesimo Scientifico. In *Dizionario Interdisciplinare di Scienza e Fede*. Edited by Giuseppe Tanzella-Nitti and Alberto Strumia. Roma: Città Nuova and Urbaniana University Press, pp. 1399–409.

- Cantore, Enrico. 2023. *Umanesimo scientifico e mistero di Cristo. Raccolta di scritti (1956–2002)*. Edited by Claudio Tagliapietra. Roma: Edusc-SISRI.
- Capra, Fritjof. 1975. *The Tao of Physics: An Exploration of the Parallels Between Modern Physics and Eastern Mysticism*. New York: Bantam Books.
- Carreño, Juan Eduardo. 2015. From self movement to esse. The notion of life and living being in Thomas Aquinas. *Angelicum* 92: 347–76.
- Carreño, Juan Eduardo. 2017. The Possibility of an Artificial Living Being in the Light of the Philosophy of St. Thomas Aquinas. *Angelicum* 94: 635–71.
- Case-Winters, Anna. 2016. *Reconstructing a Christian Theology of Nature*. London: Routledge.
- Damasio, Antonio. 1998. *Descartes' Error. Emotion, Reason and the Human Brain*. New York: Harper Collins.
- Davies, Paul. 1992. *The Mind of God. The Scientific Basis for a Rational World*. New York: Simon & Schuster.
- Davies, Paul, and Niels Gregersen, eds. 2010. *Information and the Nature of Reality. From Physics to Metaphysics*. Cambridge: Cambridge University Press.
- Deane-Drummond, Celia, and Rebecca Artinian Kaiser, eds. 2018. *Theology and Ecology Across the Disciplines. On Care for Our Common Home*. London: Bloomsbury.
- Dodd, Michael. 2012. *Unlocking Divine Action. Contemporary Science and Thomas Aquinas*. Washington, DC: Catholic University of America Press.
- Edwards, Denis. 1991. *Jesus and the Cosmos*. New York: Paulist Press.
- Edwards, Denis. 2017. *Christian Understanding of Creation. The Historical Trajectory*. Minneapolis: Fortress Press.
- Edwards, Denis. 2019. *Deep Incarnation. God's Redemptive Suffering with Creatures*. Maryknoll: Orbis Books.
- Ellis, George. 2002. *The Far Future Universe. Eschatology from a Cosmic Perspective*. Radnor: Templeton Foundation Press.
- Enriques, Federigo. 2016. *L'anima Religiosa della Scienza*. Roma: Castelvecchi. First published 1911.
- Feser, Edward. 2018. *Aristotle's Revenge. The Metaphysical Foundations of Physical and Biological Science*. Neunkirchen-Seelscheid: Editiones Scholasticae.
- Floridi, Luciano. 2023. *The Ethics of Artificial Intelligence. Principles, Challenges, and Opportunities*. Oxford: Oxford University Press.
- Florio, Lucio. 2008. Cosmic Christology and Pneumatology. Updating a Traditional Theological Topic to Approach a Dynamic Universe. In *Sens Ludzkiej Prozygody*. Edited by Valdemar Cisto and Zbigniew Kubacki. Warszawa: Wydawnictwo Rhetos, pp. 153–58.
- Francis, Pope. 2018. *Veritatis gaudium*. Apostolic Constitution. Vatican Website. Available online: https://www.vatican.va/content/francesco/en/apost_constitutions/documents/papa-francesco_costituzione-ap_20171208_veritatis-gaudium.html (accessed on 1 August 2024).
- Francis, Pope. 2023. *Ad theologiam promovendam*. Apostolic Letter, Vatican Website. Available online: https://www.vatican.va/content/francesco/it/motu_proprio/documents/20231101-motu-proprio-ad-theologiam-promovendam.html (accessed on 1 October 2024).
- Fries, Heinrich. 1996. *Fundamental Theology*. Washington, DC: The Catholic University of America Press.
- Funkstein, Amos. 1986. *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century*. Princeton: Princeton University Press.
- Gal-Or, Benjamin. 1987. *Cosmology, Physics, and Philosophy. Including a New Theory of Aesthetics*. New York: Springer.
- Ganoczy, Alexandre. 1997. *Teologia della Natura*. Brescia: Queriniana.
- Gillispie, Charles Coulston. 1980. *Dictionary of Scientific Biographies*. 16 vols. New York: Charles Scribner's Sons.
- Gregersen, Niels. 2015. *On the Scope and Depth of Christology*. Minneapolis: Fortress Press.
- Gregersen, Niels. 2016. Deep Incarnation. From Deep History to Post-Axial Religion. *Theological Studies* 72: 1–12. [CrossRef]
- Guardini, Romano. 1994. *Letters from Lake Como. Explorations in Technology and the Human Race*. Grand Rapids: Eerdmans. First published 1927.
- Harari, Yuval Noah. 2015. *From Animals into Gods. A Brief History of Humankind*. London: Vintage Books.
- Harari, Yuval Noah. 2018. *21 Lessons for the 21st Century*. London: Vintage Books.
- Harris, Mark. 2024. A Scientist-Theologian's Perspective on Science-Engaged Theology: The Case for "Theology of Science" as a Sub-discipline within Science and Religion. In *God and the Book of Nature Experiments in Theology of Science*. Edited by Harris Mark. London: Routledge.
- Harrison, Peter, ed. 2010. *The Cambridge Companion to Science and Religion*. Cambridge: Cambridge University Press.
- Haught, John. 1999. *God After Darwin. A Theology of Evolution*. Boulder: Westview Press.
- Haught, John. 2007. *Christianity and Science. Toward a Theology of Nature*. Maryknoll: Orbis Books.
- Haught, John. 2008. *God and the New Atheism. A Critical Response to Dawkins, Harris, and Hitchens*. Louisville: Westminster John Knox Press.
- Heller, Michael. 1996. *The New Physics and a New Theology*. Notre Dame: Notre Dame University Press.
- Heller, Michael. 2019. How is philosophy in science possible? *Philosophical Problems in Science* 66: 231–49.
- Hendry, George. 1980. *Theology of Nature*. Philadelphia: Westminster Press.
- Jaki, Stanley. 1987. *Uneasy Genius. The Life and Work of Pierre Duhem*. Dordrecht: M. Nijhoff.
- John Paul, Pope, II. 1988. To the Reverend George Coyne S.J. Director of the Vatican Observatory, June 1, 1988. In *Pontifical Academy of Sciences*. 2003. Rome: Papal Addresses, pp. 292–300.

- Kaiser, Christopher. 2021. *Toward a Theology of Scientific Endeavour. The Descent of Science*. London and New York: Routledge.
- Kornblith, Hilary, ed. 2001. *Epistemology. Internalism and Externalism*. Oxford: Blackwell.
- Krzanowski, Roman. 2024. Information and Biblical Logos Revisited. *Theology and Science* 22: 474–84. [CrossRef]
- Laplaine, Lucie, Paolo Mantovani, Ralph Adolphs, Hasok Chang, Alberto Mantovani, Margaret McFall-Ngai, Carlo Rovelli, Elliott Sober, and Thomas Pradeu. 2019. Why Science needs Philosophy. *Proceedings of the National Academy of Sciences of the United States of America* 116: 3948–52. [CrossRef]
- Laracy, Joseph. 2023. Science and Religion. Ian Barbour's Legacy. In *Interdisciplinary Encyclopedia of Religion and Science*. Edited by Giuseppe Tanzella-Nitti, Ivan Colagè and Alberto Strumia. Available online: <https://inters.org/ian-barbour-legacy> (accessed on 1 August 2024).
- Maldamé, Jean-Michel. 2001a. *L'universo del Big Bang. Le Christ et le Cosmos*. Paris: J. Vrin.
- Maldamé, Jean-Michel. 2001b. San Tommaso e i fondamenti della scienza. *Annales theologici* 15: 283–306.
- McGrath, Alister. 2001. *A Scientific Theology. 1. Nature*. London: T&T Clark.
- McLeish, Tom. 2019. *The Poetry and Music of Science. Comparing Creativity in Science and Art*. Oxford: Oxford University Press.
- Messer, Neil. 2020. *Science in Theology. Encounters between and the Christian Tradition*. London: T&T Clark.
- Moltmann, Jürgen. 2003. *Science and Wisdom*. Minneapolis: Fortress Press.
- Nicolescu, Basarab. 2002. *Manifesto of Transdisciplinarity*. Albany: State University of New York Press.
- Numbers, Ronald, ed. 2009. *Galileo Goes to Jail. And Other Myths About Science and Religion*. Cambridge, MA: Harvard University Press.
- Oleksowicz, Michael. 2019. Teologia della scienza. Lo status quaestionis e possibili sviluppi ulteriori. *Aisthema* 6: 204–27.
- Oleksowicz, Michael. 2020. Do we need a Theology of Science? *Cauriensia* 15: 755–70. [CrossRef]
- Pannenberg, Wolfhart. 1972. Doctrine of the Spirit and the Task of a Theology of Nature. *Theology* 75: 8–21. [CrossRef]
- Pannenberg, Wolfhart. 1993. *Toward a Theology of Nature. Essays on Science and Faith*. Edited by Ted Peters. Louisville: Westminster John Knox Press.
- Penrose, Roger. 1999. *The Emperor's New Mind. Concerning Computers, Minds, and the Laws of Physics*. Oxford: Oxford University Press.
- Penrose, Roger. 2005. *The Road to Reality. A Complete Guide to the Laws of the Universe*. New York: Vintage Books.
- Perry, John, and Joanna Leidenhag. 2023. *Science-Engaged Theology*. Cambridge: Cambridge University Press (Cambridge online). [CrossRef]
- Peters, Ted. 2005. Natural Theology versus Theology of Nature. *Theology and Science* 3: 1–2. [CrossRef]
- Polak, Pawel. 2023. Philosophy in Technology. A Research Program. *Philosophical Problems in Science* 75: 59–81. [CrossRef]
- Polanyi, Michael. 1998. *Personal Knowledge. Towards a Post-Critical Philosophy*. London: Routledge. First published 1958.
- Polanyi, Michael. 2009. *Tacit Dimension*. Chicago: University of Chicago Press. First published 1967.
- Pontifical Academy of Sciences. 2003. *Papal Addresses to the Pontifical Academy of Sciences (1917–2002) and to the Pontifical Academy of Social Sciences (1994–2002)*. "Scripta varia", n. 100. Vatican City: Libreria Editrice Vaticana.
- Rovelli, Carlo, and Giuseppe Tanzella-Nitti. 2024. Universo. Un disegno poco intelligente. La scienza non può dimostrare l'esistenza di Dio. *Corriere della Sera*, March 21.
- Rovelli, Carlo. 2022. *Helgoland. The Strange and Beautiful Story of Quantum Physics*. New York: Penguin Books.
- Rudner, Richard. 1953. The Scientist Qua Scientist Makes Value Judgments. *Philosophy of Science* 20: 1–6. Available online: <https://www.jstor.org/stable/185617> (accessed on 1 August 2024). [CrossRef]
- Runehov, Anne, and Luis Oviedo, eds. 2013. *Encyclopedia of Sciences and Religions*. Dordrecht, Heidelberg, New York and London: Springer Reference.
- Russell, Robert John. 2002. Science and Theology, Dialogue between. In *Interdisciplinary Encyclopedia of Religion and Science*. Edited by Giuseppe Tanzella-Nitti, Ivan Colagè and Alberto Strumia. Available online: <https://inters.org/dialogue-science-theology> (accessed on 1 August 2024).
- Russell, Robert John. 2008. *Cosmology. From Alpha to Omega*. Minneapolis: Fortress Press.
- Russell, Robert John, Nancey Murphy, and William Stoeger, eds. 2008. *Scientific Perspectives on Divine Action. Twenty Years of Challenge and Progress*. Vatican City and Berkeley: Vatican Observatory Publications—The Center for Theology and the Natural Sciences.
- Russell, Robert John, William Stoeger, and George Coyne, eds. 1988. *Physics, Philosophy and Theology. A Common Quest for Understanding*. Vatican City: Libreria Editrice Vaticana and University of Notre Dame Press, pp. 21–48.
- Russell, Robert John, William Stoeger, and George Coyne, eds. 1990. *John Paul II. On Science and Religion*. Vatican City: Libreria Editrice Vaticana and University of Notre Dame Press.
- Sánchez Cañizares, Javier. 2024. Review to Michel-Yves Bolloré and Olivier Bonnassies, Dios, la ciencia, las pruebas. El albor de una revolución. *Scripta theologica* 56: 235–39.
- Sánchez Sorondo, Marcelo, ed. 2009. *I papi e la scienza nell'epoca contemporanea*. Milano: Jaca Book.
- Slattery, John, ed. 2020. *T&T Clark Handbook of Christian Theology and the Modern Sciences*. London: T&T Clark.
- Smolin, Lee. 1998. *The Life of the Cosmos*. New York: Oxford University Press.
- Strumia, Alberto. 1987. *L'uomo e la scienza nel magistero di Giovanni Paolo II*. Casale Monferrato: Piemme.
- Strumia, Alberto. 2007. *Il problema dei fondamenti. Da Aristotele a Tommaso d'Aquino all'ontologia formale*. Siena: Cantagalli.
- Strumia, Alberto. 2009. *Il problema dei fondamenti. Un'avventurosa navigazione dagli insiemi agli enti passando per Gödel e Tommaso d'Aquino*. Siena: Cantagalli.

- Strumia, Alberto. 2019. Information. Recent Perspectives for the Natural Sciences. In *Interdisciplinary Encyclopedia of Religion and Science*. Edited by Giuseppe Tanzella-Nitti, Ivan Colagè and Alberto Strumia. Available online: <https://inters.org/information-natural-sciences> (accessed on 1 August 2024).
- Stump, James, and Alan Padgett, eds. 2012. *The Blackwell Companion to Science and Christianity*. Malden: Wiley-Blackwell.
- Tabaczek, Mariusz. 2021. *Divine Action and Emergence. An Alternative to Panentheism*. Notre Dame: University of Notre Dame Press.
- Tabaczek, Mariusz. 2024. *Theistic Evolution. A Contemporary Aristotelian-Thomistic Perspective*. Cambridge: Cambridge University Press.
- Tagliagambe, Silvano. 2000. La vittoria di Babele. Dalla filosofia naturale alla separazione dei linguaggi. *Civiltà delle Macchine* 18: 5–15.
- Tagliagambe, Silvano. 2016. Ragione scientifica e saggezza umana. Il problema della verità nella scienza e nella filosofia. *Divus Thomas* 119: 44–91.
- Tanzella-Nitti, Giuseppe. 1997. The Aristotelian-Thomistic Concept of Nature and the Contemporary Scientific Debate on the Meaning of Natural Laws. *Acta Philosophica* 6: 237–64.
- Tanzella-Nitti, Giuseppe. 2009a. *Faith, Reason and the Natural Sciences. The Challenge of the Natural Sciences to the Work of Theologians*. Aurora: The Davies Group.
- Tanzella-Nitti, Giuseppe. 2009b. La persona, soggetto dell'impresa tecnico-scientifica. *Paradoxa* 3: 96–109.
- Tanzella-Nitti, Giuseppe. 2012. Religion and Science as Inclinations towards the Search for Global Meaning. *Theology and Science* 10: 167–78. [CrossRef]
- Tanzella-Nitti, Giuseppe. 2022a. *Scientific Perspectives in Fundamental Theology. Understanding Christian Faith in the Age of Scientific Reason*. Claremont: Claremont Press.
- Tanzella-Nitti, Giuseppe. 2022b. *Teologia della Rivelazione. Fede, Tradizione, Religioni*. Roma: Città Nuova.
- Tanzella-Nitti, Giuseppe. 2023. Tommaso d'Aquino e il pensiero scientifico contemporaneo. In *Vetera Novis Augere. Le risorse della tradizione tomista nel contesto attuale. Vol. 1: Bilancio e prospettive*. Edited by Serge-Thomas Bonino and Luca Tuninetti. Roma: Urbaniana University Press, pp. 151–79.
- Tanzella-Nitti, Giuseppe, and Alberto Strumia, eds. 2002. *Dizionario Interdisciplinare di Scienza e Fede. Cultura Scientifica, Filosofia e Teologia*. 2 vols. Roma: Urbaniana University Press-Città Nuova.
- Teilhard de Chardin, Pierre. 1969. *Comment je crois*. Paris: Seuil. First published 1934.
- Teilhard de Chardin, Pierre. 2021. *The Human Phenomenon*. Easterbourne: Sussex Academic Press. First published 1948.
- Torrance, Thomas Forsythe. 1984. *Transformation and Convergence in the Frame of Knowledge. Explorations and Interrelations of Scientific and Theological Enterprise*. Grand Rapids: Eerdmans.
- Torrance, Thomas Forsythe. 2005. *Space, Time and Incarnation*. London: T&T Clark.
- Tyson, Paul. 2022. *A Christian Theology of Science. Reimagining of a Theological Vision of Natural Knowledge*. Grand Rapids: Baker Academics.
- Van Huyssteen, Wentzel, ed. 2003. *Encyclopedia of Science and Religion*. New York: MacMillan-Gale Group.
- Vatican Council II. 1965. *Documents of the Second Vatican Council*. Vatican Website. Available online: https://www.vatican.va/archive/hist_councils/ii_vatican_council/index.htm (accessed on 1 August 2024).
- Verschuuren, Gerard, and Joseph Koterski. 2016. *Aquinas and Modern Science. A New Synthesis of Faith and Reason*. Kettering: Angelico Press.
- Wallace, William. 1968. Thomism and Modern Science: Relationships, Past, Present and Future. *The Thomist* 32: 67–83. [CrossRef]
- Winslow, Lisanne. 2020. *A Trinitarian Theology of Nature*. Eugene: Pickwick Publications.

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