Issues in Science and Religion: Publications of the European Society for the Study of Science and Theology

Michael Fuller
Dirk Evers
Anne Runehov *Editors*

Issues in Science and Theology: Creative Pluralism?

Images and Models in Science and Religion

ESSSAT

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Volume 6

This series comprises biennial volumes produced by the European Society for the Study of Science and Theology. Each volume will contain approximately 12-15 papers, which are edited by an expert panel. Each volume offers a 'state of play' perspective regarding the area of dialogue between science and religion being considered, looking both at the current situation and at likely further developments within that area. They aim to lay the fruits of current research in specific areas before the wider science-and-religion community, and the general public.

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Preface

From 23 to 26 June 2021, ESSSAT, the *European Society for the Study of Science and Theology*, arranged the Eighteenth *European Conference on Science and Theology* (ECST XVIII) in Madrid, Spain, in collaboration with *Comillas Pontifical University*. It was a conference under special conditions. The conference had been planned for 2020 but had to be postponed due to the Corona situation, which emerged in Spring that year. Finally, we chose June 2021 to catch up on the conference and were lucky to hit a time where travelling became possible again, at least for some countries. With great effort and amazing energy, our local organisers at Comillas set up a remarkable conference at a venue a little outside Madrid and made it possible to participate in the conference online as well. In the end, there were about 30 participants at the spot with many more joining the conference online. Three of the five main speakers could also be with us, while two gave their lectures online. At the venue, 15 short papers were presented in person, and nearly 30 short papers were discussed in online sessions.

For many, the Madrid conference was the first academic conference to take part in since the outbreak of the pandemic, and one could sense the joy and enthusiasm throughout the conference, for which the beautiful weather, the wonderful city of Madrid and the hospitality of the wonderful people from *Centro Santa María de Los Negrales*, our venue, also contributed their share. Thus, ESSSAT was able to continue the study of the interactions of science, religious studies and theology with this special conference that was under the theme *Creative pluralism? Images and models in science and religion*. It had been a consensus in the science and religion dialogue that convergences between science and religion are possible and, indeed, necessary, because both disciplines refer to the same reality and try to interpret and understand it. However, in recent years, not only the differences between religious hermeneutics and scientific method have been stressed but also the inherent plurality within both fields of academic study. And in epistemology it has become clear how important perspectives, models and paradigms are, again for both science and theology. Scientific theory, for example, develops mathematical models or visual representations of phenomena, like brain scans, while theologians are aware of the fact that for religion symbols are indispensable in pointing to the divine. It is widely

accepted that all human understanding is shaped and guided by models and images, by intuitive approaches and cultural categories. And scientific as well as religious communities provide such categories – for better or worse. Is there plurality in science? How important, how inspiring and how limited are scientific models? Is plurality of and in religions an indication of their problematic, arbitrary approach towards reality? When do models and images serve as useful tools, and when do they turn into limiting stereotypes and narrow prejudices – in science, in religion and in the dialogue between both fields? These and related questions were discussed during the inspiring days we had in Madrid. The five plenary lectures of the conference covered a broad spectrum of disciplines and approaches and are printed in this volume in revised and edited versions. In addition, the editors chose a selection of short papers presented at the conference and thus composed this volume of *Issues in Science and Religion* (ISR).

As ESSSAT's president, it is my pleasure and duty to take the opportunity of the publication of this issue to thank organisers and sponsors of the conference. ESSSAT expresses its deep gratitude to the local organisers Sara Lumbreras Sancho (ESSSAT Vice President for the conference), Jaime Tatay Nieto (Comillas University) and José Manuel Caamaño López (Theological Faculty) and their team from *Cátedra Francisco José Ayala de Ciencia, Tecnología y Religion* (CTR) at Comillas University. Special thanks go to Raquel López Garrido for her work as Secretary of the Chair and registration officer before and during the conference. We thank Comillas university for its support, both financially and logistically. Other members of the Organising Committee were Ingrid Malm Lindberg (ESSSAT Secretary), Sarah Lane Ritchie (Scientific Programme Officer) and Roland Karo (ESSSAT treasurer). Finally, we thank the staff from Springer for their cooperation on this volume and our book series.

Halle (Saale), Sachsen-Anhalt, Germany Dirk Evers
March 2022

Introduction

How are we to understand images and models used in science and religion/theology? What dialogues are feasible between these fields regarding these topics? Are they totally divergent, in the sense that they describe entirely different realities, or can they connect – and, if so, where, and how? Within the sciences, models are mediators between hypotheses and the 'real world', or part of it. But what could the real world mean within religion/theology? Could models be autonomous or semi-autonomous agents that function as instruments of investigation into the domains of religion/theology, the sciences and the 'real world'? There is a considerable pluralism of disciplines within the sciences and likewise within theologies and religions. The question addressed by the authors in this book is whether there could be a *creative pluralism* – in the sense that images and models used in different fields and their pluralistic disciplines have potential for mutual beneficial interaction. For example, in biology, whether experimental or historical-descriptive, models are often used in senses that differ from those of physics. Furthermore, what kind of models are used – explanatory or exploratory models? Living in the Covid 19 era, both kinds of modelling are needed and used. At the explanatory level, the models serve to synthesise and demonstrate what is already known, while the exploratory model leads (or may lead) to further knowledge and insights. In other words, exploratory models are more open to the creative imagination compared to explanatory ones. Imagination implies 'seeing images' and using them as a means for further investigation: it is used in all academic disciplines. Creativity is the key requirement for imagination and modelling. The authors in this volume, coming from a diversity of disciplines, are therefore reflecting on academic *creative pluralism.*

This book is divided into three parts, looking first at some philosophical and methodological considerations, then at some scientific perspectives, and finally at some religious/theological perspectives. Of course, there are contributions which cross these boundaries. This bears witness to the thoroughgoing interdisciplinarity which surely must characterise discussions of pluralism and the use of images and models within the academic fields of science and religion.

Philosophical and Methodological Perspectives

We begin with an exploration and comparison of pluralism in science and religion/theology. According to Lluis Oviedo, the general assumption is that theology is necessarily pluralistic while pluralism in science is provisional and limited: it is a temporary state, waiting for better results to reveal a more accurate result. However, Oviedo asks if this is indeed the case. Analysing the subject of pluralism in science, he argues that science is not free from pluralism, especially when complex phenomena are studied, such as life, the human person, or society and religion. He highlights two fundamental causes for pluralism in science. One cause is subjective, meaning that scientific activity cannot avoid the cognitive conditions of the human mind, mental styles and biases. The other cause is objective, referring to the complexity of the realities science tries to describe. Oviedo argues that only multiple accounts can render an accurate account of what is observed. He sees two common grounds in the pluralism of science and theology: first, the complexity of both natural phenomena and the divine, and second, the role played by belief.

Language is, of course, a vital means of our communicating and teaching ideas in both science and religion/theology, and metaphors and images have a crucial role to play in this. Andrew Pinsent addresses the importance of these linguistic devices as means of our understanding the world, noting that 'a plurality of metaphors is often needed for the kinds of objects of special study in both science and theology', and observing the particular importance of metaphor in revealed theology. He also notes the ways in which, historically, theologians have borrowed from the science of their day in developing metaphors through which to explore the divine.

But such considerations are by no means unique to explorations within the Christian tradition. Writing from an Islamic perspective, Rana Dajani emphasises the importance of religion for studying nature's complexity. Indeed, she argues, while science is about discovery, religion guides science by providing both a framework for exploring nature and guidelines for how to deal with scientific discoveries. Hence, religion is not concerned with questioning the sciences, but neither is it about trying to make scientific discovery compatible with religious texts. Dajani maintains that science and religion are not only compatible but also complementary. She notes the challenges offered by cultural evolution, consciousness, and epigenetics, and the obstacles to science in grasping the richness of nature. Another obstacle is the use of different concepts by the different disciplines to denote the same phenomenon. She argues that while Islam is about searching for the truth by way of the scriptures, carefulness regarding different interpretations is needed. Her conclusion is that there is a need to raise awareness within education and within multidisciplinary committees, and for further (interdisciplinary) research to proceed 'with an open mind led by the ethical frameworks of theology, with respect and trust'.

Silke Gülker investigates further the use of images in science and religion. According to her, images function as a bridge between the available and the unavailable. Instead of contrasting science and religion, she focuses on the boundary

between them. Gülker analyses the social construction of boundaries between availability, which is associated with science, and unavailability, associated with religion. To do so, she leans on Shütz and Luckmann's phenomenological understanding of transcendence, emphasising that experiences simultaneously refer to something that is indicated by, but not present in, this experience. Gülker suggests that this ambivalence is what the boundary is all about. The problem is, where to put the boundary on the scale of what is available and what is unavailable. To answer the question, she explores the function of images in the social construction of boundaries between the available and the unavailable by looking at images used in stem cell research.

Lisa Stenmark argues that the essence of the science and religion discourse (SRD) is to explore the differences between the disciplines that lead to creative insights about who we are and about the world we live in. For her, creative pluralism is about the *epistemic* differences between religion and science, and this implies a need for a better understanding of epistemic pluralism in order to find fresh approaches to epistemic difference. After a brief presentation of some decolonial critiques of Western epistemology, she proposes two alternative approaches. The first is to realise that epistemology shapes ontology and not the other way around. The second approach is Hannah Arendt's method of 'storytelling'. The aim of these approaches is to show the importance of a multiplicity of worlds (pluriverse), recognising difference without privileging one world over another. Stenmark argues that the SRD should be in the frontline of decoloniality; however, this implies a critical analysis of the ways in which colonialism is still present in SRD's structures and ideologies. That in turn implies recognising the ways in which we still arbitrarily recognise the *cultural* neutrality of science, putting it over and above other disciplines that have no such claims or recognition.

In the last chapter in this part, Emily Qureshi-Hurst explores the extent to which science and religion should interact concerning models and theory formation. She stresses the importance of reaching a 'Maturation Point' for a fruitful interaction between these two academic fields of research to take place. This is because there are three problems which must be overcome. First, science and theology use different *methodologies* to construct their models. Second, these models are subject to analyses using different *assessment criteria* in science and theology. Third, if an interaction takes place too early, it can disrupt the *integrity* of the model and hence does not lead to deeper insight. Qureshi-Hurst concludes that the academic fields of science and theology should develop their models until they are robust and reliable: then, and only then, can interaction between science and theology be encouraged.

Scientific Perspectives

In the second part of our book, scientific perspectives are to the fore. Eduardo Gutiérrez Gonzáles explores Einstein's views on the scientific imagination. After briefly presenting Einstein's vision of reality, as well as his ideas on transcendence,

Gutiérrez Gonzáles develops the fundamental features of Einstein's cosmic vision. To Einstein, scientific imagination can only take place once a cosmic religious feeling, providing one with the appropriate motivation and space for innovation, is established. But how does this happen? Gutiérrez Gonzáles explains this by discussing Einstein's *On the Method of Theoretical Physics.* Imagination has two important roles, which Gutierrez Gonzales calls *visual image play* and *conceptualization.* Taken together, these roles of imagination in science serve as an analogical bridge between experience and logical thinking.

Alfred Kracher emphasises the universal importance of metaphors and models in science and religion. But do they denote the same thing? He argues that elucidating differences in the use of metaphors and models can resolve misunderstandings and may lead to new insights about their role. He argues that the meaning of metaphors and models in science and religion may be roughly the same, but the relationship between metaphor and model (within separate disciplines) turns out to be otherwise. The difference between them is that models are analytical while metaphors are holistic, even though there is no clear boundary between them, but rather a continuum. Metaphors are processed by the human mind and appeal to both human cognition and human emotion. Metaphors have their basis in the evolution of *Homo sapiens* who at some point combined specialised faculties (e.g., hunting) with their intelligence, resulting in the ability to construct analogies. With the advances of the sciences, metaphors were used to develop models, which, unlike metaphors, can be tested. In science, once a model is in place, metaphors can be discarded. This is not the case in religion, which is always metaphorical since transcendent reality can only be captured in metaphors.

Can human cognition offer insights into all this? Lluis Amaral discusses the hard problem of consciousness, using insights from recent advances in neuroscience. He replaces the introspective approach of consciousness (a first person perspective) with an empirical approach (a third person perspective) and moves from idealism to realism. His aim is to show that using a realist-naturalist perspective, some yet unsolved problems of philosophy of mind like the hard problem of consciousness may be seen as misplaced questions. The questions which need to be addressed are: (1) Why can the reality of consciousness not be explained? (2) How can neural processes give rise to subjective states? (3) Why does consciousness exist at all?

Models may address various different concepts. Buki Fatona tackles the paradox that is lurking in the use of those scientific and theological models which she calls *transcendent models.* One such model is the infinite. Although these models are meant to be imagined understandings of what they represent, what kind of imagery could accompany such transcendent concepts? If imagining transcendent models is meaningless, then so are the understandings acquired from these models. To resolve this problem, Fatona contrasts two models of the infinite: John Scotus Eriugena's description of God as *nihil per infinitatem* (theology) and Euclid's second postulate that any straight-line segment can be extended *ad infinitum* (mathematics). To imagine a thing, x, is to generate a kind of a mental image of that x; but neither God as *nihil per infinitatem* nor an infinitely long line-segment can be imagined as such. Drawing on philosophy of mind, cognitive neuroscience, mathematics and abstract

art, Fatona establishes an alternative imagistic account of imaginations involving transcendent models.

Bruno Petrušić and Niels Henrik Gregersen argue against Dennett's view of consciousness in terms of sub-personal mechanisms, using the Selective Awareness Experiment (SAE) designed by Ulric Neisser and Robert Becklen (1975) and repeated by Daniel J. Simons (1999). In contrast to Dennett's naturalistic 'nothing but' explanation of consciousness, based on 'not yet realised' neuroscience, they show that different causes cannot be put together in one single explanation. Their version of the SAE points to the different effects of conscious attention (awareness) among participants in a psychological experiment. Their experiment shows not only that consciousness matters but also defends the relevance of psychological character traits, and socially and culturally learnt practices. Besides the experiment, they present arguments, metaphors and contexts indicating that conscious states and individual processes of learning have causal significance, and hence should be part of a wide scope of reality. Causal effectiveness, they argue, is real, and not merely an epiphenomenon. Learning processes and direct attention on a personal level are mental states, whilst sub-personal mechanisms are brain states.

This part of our book concludes with Javier Monserrat's investigation of the metaphysical uncertainty which has its basis in holistic models assumed in the dialogues between science and religion. Monserrat notes the way in which a variety of understandings of science in the twenty-first century has led also to a variety of understandings of the roles played by models within science. In common with earlier scholars like Barbour, Polkinghorne, Peacocke and Ellis, Monserrat argues that the universe is enigmatic, implying the plausibility of a universe that includes God and one that does not, and he maintains that the silence of God generates an obstacle for deciding between the two. He further maintains that humans possess an inner religiosity, which means that religion must be universal, and that there is a deep essential unity of all religions.

Religious and Theological Perspectives

The third part of the book turns to religious and theological reflections. Ernst M. Conradi explores models for intertwining the story of God with the story of the universe. His question is: How do the stories of the immanent Trinity and the economic Trinity relate to the story of life on Earth? Is the Christian story part of the Earth story, or *vice versa*? To explore this question, Conradie suggests a new typology. This typology includes five scenarios: (1) the Christian story encompasses the universe story, (2) the universe story encompasses the Christian story, (3) the Christian story and the universe story remain apart from each other, (4) the universe story may be interpreted through the Christian story, and (5) the Christian story may transform the universe story.

Are there discontinuities as well as continuities between the ways in which science and religion/theology make use of models? Michael Fuller maintains that the

models used by theology draw on analogies with the natural world, but this world is entirely different from the world of the Divine. Fuller explores the idea of nescience (not-knowing) in the work of Pseudo-Dionysius the Areopagite, and urges that the importance of nescience in theology leads to a radical dissimilarity between it and science. While both use models, accepting Dionysian theology implies that all models must remain inadequate when applied to God. Fuller concludes that '[u]ltimately, the approach to God has to do not with knowing – science – but with not-knowing – nescience. And no model can assist in that approach'.

James Thieke presents a model for relating psychological and theological understandings of humanity which is based on Christology. In doing so, Thieke draws on Deborah van Deusen Hunsinger's use of the Chalcedonian Definition, exploring this by way of the ideas of three Eastern Orthodox thinkers: John Zizioulas' notion of truth as communion, Christos Yannaras' approach *via* the Energies of God and creation, and Alexei Nesteruk's understanding of the epistemological horizons of science and theology. Based on these, Thiecke argues that psychological and theological understanding of humanity can be understood in terms of a relationship of *participation.*

Janna Gonwa argues that scientific models may serve as a valuable tool for theological inquiry and may lead to more insightful and responsible theological models. By way of a case study, she discusses merging dynamic system models within theological studies of personal identity, and explores the potential benefits as well as inherent risks of integrating scientific models in theological reflection. As a benefit, she mentions the power of integrative reflection to fulfil the apophatic mandate: another benefit is that a scientific model may provide innovative ideas for theologians. She identifies as risks: (1) potential theoretical errors, which may arise through not paying attention to the limits of scientific methodology, (2) category mistakes, (3) theological supersessionism (replacement of previous theology by new without giving due regard to previously important theological aspects), and (4) concentrating more on the *how* of creation rather than its meaning. Finally, Gonwa proposes a set of guidelines for how scientific models can be used in a responsible manner in theology.

Philippe Gagnon asks the interesting question: Does pluralism itself need to be plural? He argues that neo-positivism has for some time now focused on using a fact-derived language, banning metaphoricity. He explores the reasons pluralistic epistemology came to be adopted, and leads us through some important philosophical problems and how they were tackled by different philosophers and in various times. Such philosophical problems or questions concern theories, truth and knowledge. If a theory is considered to be the best one, on which criteria is this judgement made? Might it be better to have several theories that are *ex æquo?* Gagnon argues that even though 'pluralism' is a better term compared to 'the many', it does not entirely escape relativism. Hence, he proposes to use 'plurality' instead, which does not threaten the unity of truth. After this philosophical exploration, he turns to theology, specifically Trinitarian theology, to implement his findings there.

There can be few issues more important in the twenty-first century than ecological sustainability. Jaime Tatay notes the renewed involvement of faith-based organisations with the quest for sustainability, looks at the science behind such a quest, and explores the role that may be played within it by images, metaphors, and models supplied both by science and by interreligious studies. He argues that there are partly overlapping metaphors, concepts and images concerning sustainability in both disciplines that could lead to fruitful dialogues as well as joint action, and he identifies and describes ten such overlapping themes. These themes are: steward and inhabitant, common home, limit, stability, collapse, environmental justice, transition, dialogical knowledge, emergence, and alliance. Tatay concludes that 'Reaching a consensus on a narrative intelligible to both [scientific and religious] audiences will help chart the journey towards a sustainable future'.

Our collection concludes with Sarah Lumbreras' investigation of a possible new understanding of embodiment. She presents some of the models of human beings that have existed in Western and Eastern tradition through history, noting that it was in Ancient Greece that the notion of dualism made its entrance. This dualism was between matter (body) and mind but also, more specifically, between the heart and the brain. Slowly there was a move towards cerebro-centrism, a dualism that would lie at the heart of philosophy for centuries thanks to the influence of Descartes. However, Lumbreras has a different understanding of the dualist problem. For her, the body became 'a consumer good […] something external to the identity of the person'. This dualist view, she continues, is inconsistent with current scientific findings. There is a need to develop more realistic models of embodiment; she suggests looking more closely at Eastern philosophies/religions, not least the chakra system, which could pave the way for new techniques to improve well-being.

As we noted above, many of the papers gathered together in this book resist classification, since they range widely over scientific, theological and philosophical territory – reflecting thereby the creative outlooks of their authors. It is our hope that they may prove stimulating and valuable to a readership with a wide range of academic interests.

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Part I
Philosophical and Methodological Perspectives

Unavoidable Pluralism in Theology and Transitory Pluralism in Science? Mapping the Diversity

Lluis Oviedo

Abstract A general perception expects that science might overcome current pluralism to achieve unified and proven knowledge regarding almost everything, while theology must be content with an unavoidable level of pluralism that cannot be overcome in the present circumstances. Deeper scrutiny shows that such a contrast could be far from how things really are. Indeed, some recent studies point to a pluralistic stance in scientific research, and a more realistic epistemology reveals several levels at which pluralism appears as consubstantial to scientific activity, as happens when beliefs are considered. Theology can find a better ground to dialogue with science when this model is pursued, and this is particularly the case in the new scientific study of religion.

Keywords Belief systems · Complexity · Consilience · Epistemology · Meaning · Reductionism · Theological pluralism

1 Introduction

A general perception assumes that theology is pluralistic by necessity, and cannot be otherwise, while pluralism in science is just provisional and very limited. To justify such views, the usual argument is that theology, by its own nature, object and method, cannot settle in a definitive way the many versions or interpretations built around canonical texts and traditions. Besides this, the inscrutable character of the divine, which by definition is beyond any human representation or test, renders vain any effort at reaching a more objective knowledge, or at least a greater consensus among scholars when trying to better describe ultimate reality and the ultimate source of meaning. Several attempts at organizing such pluralism witness to the

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theological vocation to come to terms with that condition (Niebuhr 1951; Frei 1992; Bevans 1992).

Moving to science, the impression is that the apparent pluralism perceived in several fields is just a provisional state waiting for better observation, experiments and data, which – in due time – would settle the outstanding issues and finally reveal the most accurate representation or model of the studied reality or process, something that would simply put an end to discussions and plural versions; it is just a question of time. Indeed, we will hardly find in science something like Niebuhr's attempt to organize pluralism in theology in his classic book *Christ and Culture* (Niebuhr 1951).

The aim of the present paper is to review those ideas, to show to what extent the unavoidable pluralism in theology does not represent a negative stance, and to indicate that science cannot display a greater degree of consensus or unanimity, particularly when what is observed moves towards the limits or more mysterious and complex realities – especially (but not only) at the anthropological level. Possibly, when approaching such limits, both theology and science need to rely more on belief systems, since certainty becomes scarcer, but nevertheless a guiding representation is required, and meaning in life becomes a necessity. Related topics are the recent discussion on cognitive pluralism and epistemic levels in every enquiry – scientific and theological – and the consequent crisis of the most reductive approaches and the dreams of a 'consilience' ideal aimed at connecting and ordering all the levels present in real processes and in their cognitive models (Wilson 1998).

At this stage, theology is invited to engage with the current discussion and to find its own place in the new representation, and in the epistemological clues revealed in the high degree of complexity observed in nature, and the multi-level strategies that more and more scientists demand when dealing with such complex dynamics. Finding a new place and re-defining the relationships and connections of theology with sciences become one of the greatest challenges when being aware about these new trends, which open unexpected opportunities at the same time. This paper attempts to compare scientific pluralism – after recent developments in analysing it – and theological pluralism, as has been developed and elaborated in a long tradition. This comparative exercise could provide a better ground for dialogue, and for tackling epistemic issues regarding those distinct cognitive styles. The apparent conflict between new scientific and traditional theological accounts of religion could be better described and settled after applying this analysis.

2 Theology – Feeling Bad Before a Strong Science and Its Certainties

Approaching science from a theological point of view could become a complex and mortifying exercise, comparing the often fuzzy and symbolic style of theology with the accurate, sure and highly formalized knowledge produced by scientists. Theologians could not compete with that technical and sometimes elegant display of systematisation and precision. While theology faces an insurmountable and

somewhat chaotic pluralism, resulting from what Paul Ricoeur designated 'the conflict of interpretations' (Ricoeur 2007), scientific knowledge can fix everything with a unified model able to disclose the mysteries of natural phenomena. Well, this was at least the impression we might get at first. Obviously, pluralism and conflicting interpretations are not unique to theology, but common to all the humanities, and still more evident in philosophy and the social and human sciences; at least theology can resort to a canon or authority that settles conflicting views within a tradition, but for philosophy, history or anthropology, no such authority is recognized, and pluralism can – at best – be perceived as a richness, and – at worst – as a hindrance to any attempt to build solid knowledge.

However, things have changed in the last few decades. A general perception is growing that science is not free from pluralism, even if that trait is different in science to the way it appears in theology and humanities. A necessary first step is to review recent attempts to describe and come to terms with that growing awareness regarding science. Several strands can be identified. The first one is philosophical or epistemological: it points to general limits in human cognitive capacities. That strand has been explored in several ways: one belongs to the postmodern tradition, another exploits topics from cultural studies, and the most rigorous develops a plural epistemology as an unavoidable condition of knowledge. The second strand is more descriptive and assumes a *de facto* pluralism in several scientific realms or research programs, developing sometimes contrasting models, or at least some patchwork parsing different areas in different ways. The third strand is structural and reflects on different levels and methods approaching reality: pluralism becomes an unavoidable trait when some more complex subjects are approached, like life, the human person, or society and religion. Let's look at these strands more closely.

In broad strokes, pluralism in science – somewhat different to that in theology – recognises two fundamental roots or causes, one subjective and the other objective. From the subjective side, arguments have been developed in recent years that clearly reveal how scientific activity cannot avoid the cognitive conditions that are deeply seated in the human mind and our resulting mental styles or biases. Furthermore, cultural influences, values systems and interests clearly inform scientific research programs and their development. For instance, Angela Potochnik in her book *Idealization and the Aims of Science* (2017) points out how values are deeply entrenched with scientific activity, and that even the researcher's gender determines interests and perspectives when studying some fields. The same can be stated regarding climate studies, and how values and interests influence research at various levels. She summarizes her point focusing on four different levels:

1. 'Scientific products are partial and idealized': they serve different aims.
2. Aims in science are shaped by values, reflecting human goals.
3. There is a lack of coherence in different levels of organization.
4. Scientific activity reflects human concerns or interests (Potochnik 2017: 219).

As a result, science becomes unavoidably plural, which should not be seen as a loss, but rather as a state of affairs that invites us to recognise that the main goal of science is not so much to reach the truth, or an accurate representation of real