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Contents

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Instructions to Authors

ESSSAT News and Reviews publishes academic style book-reviews and article-reviews, or articles describing the current developments in a sector of science-and-theology through the analysis of recent publications.

The fields covered are:

- general developments in science-and-theology;
- philosophical and epistemological issues;
- cosmological and physical (quantum) issues;
- evolutionary and biological questions;
- anthropological areas;
- the scientific study of religion;
- historical studies in the field of science-and-theology
- practical or ethical issues.

Book reviews should normally be of 700-1500 words. Review-articles should be kept between 3000 and 4000 words. In both cases contributors are asked to bear in mind that the majority of readers will not be specialists in the same field, and will not have English as their first language.

This publication will favour the Chicago Style Citation format.

Submissions and all correspondence should be sent to the Editor, Lluis Oviedo: *loviedo@antonianum.eu*

From the Editor

The relationship between science, religion and theology is surely deeply influenced by context, culture and even group and personal experiences. This is not new: our endeavour is very context-sensitive, and cannot be otherwise. How theology perceives science depends a lot on scientific developments or advances and social perception, and hence the hypothetical balance between both fields will be strongly marked by scientific prowess and its increasing success or failure. This is most apparent regarding technical applications that could benefit everybody's life.

Theological discernment of scientific progress can be cast as an exercise in what has classically been designated as reading the "signs of the times", or the events and circumstances that believers think may express or reveal the Divine's plan, or at least how we as society and world adjust to – or move away from – that plan.

It is disputable to what extent such an exercise of theological discernment is useful, and for whom. Churches or Christian communities would need guidance from experts when dealing with scientific and technical advances, especially when applied to health and human betterment. It is possibly less clear to what extent such judgment might raise interest and could benefit scientists, feeling perhaps uncomfortable being interrogated by external and uninvolved parties. Others might be grateful for such assessments, coming from those who are concerned for ultimate values and meaning, and less blinded by immediate interests.

These introductory remarks are aimed at presenting this issue of our Bulletin and its Article Review, which this time takes a more ethical direction, to deal with recently developed techniques of genetic editing and their promising therapeutic applications. It is authored by our French colleague François Nau, an expert in this field. Even if science-and-theology is not just about ethical judgement, the point is that we cannot avoid such an engagement, and that should reflect a responsible attitude from the theological side, a way to feel concern and involved in issues that cannot remain unexamined by attentive theological observers.

The genetic field is not the only one in which the criteria described apply. Take the case of Artificial Intelligence (AI), whose development raises concerns at the philosophical, theological, and practical levels. It would be a big mistake to neglect this research area in our program to come to terms with relevant developments in all deeply sensitive areas. It is therefore appropriate that we are able to include here a review of a recent book dealing with AI, its promises, and its limits. This, too, could help our discernment exercise.

The remaining reviews offer a plural panorama that reflects both the focus and directions of current research as books emerge from academic publishers, and the interests of our reviewers, who do not only contribute with their generous effort to provide very informative accounts of what is new in our field, but offer hints on what is relevant and hotter in the current exchange between science, religion and theology. Indeed it would be interesting to survey the published reviews in the last 20 years – now that we reach issue 30 of our bibliographic Bulletin – and to try to spot which have been the relevant topics and whether and how they have changed over these years.

There is a second way on how context influences science-and-theology, this time strongly including lived religion in the equation. I mean the historical circumstances, and indeed this is a time in which for many the perceptions of science and religions have changed after the pandemic outbreak and the view about the roles science and religious faith could play in this very testing context. Indeed, one English University has published a call for papers inviting proposals for research projects on science and beliefs in the pandemic period. It is apparent that these circumstances have moved many to reconsider both science and religion with their effective roles, and we are still trying to come to terms with these changes.

I hope that everything will improve in the coming months and that we shall soon be able to celebrate that this is all over, and we can profit from these experiences, in all their significant aspects.

Lluis Oviedo, Editor

Article Review

Ethical Issues Around Genetic Editing

François Nau, Université de Poitiers

Jamie Metzl, *Hacking Darwin: Genetic Engineering and the Future of Humanity*. Sourcebooks Inc., Naperville, Il (2019). 306 pp. ISBN 978-1-4926-7009-4.

Françoise Baylis, *Altered inheritance: CRISPR and the Ethics of Human Genome Editing*. Harvard University Press (2019). 268 pp. ISBN 978-0-674-97671-9.

Erik Parens and Josephine Johnston, eds., *Human flourishing in an Age of Gene Editing*. Oxford University Press (2019). 266 pp. ISBN 978-0-19-094036-2.

Concerns about the potential modification of the human genome were expressed as soon as the genetic engineering techniques appeared, at the beginning of the 1980's. However, the debates remained somewhat speculative as long as the technical difficulties appeared too overwhelming for any practical implementation to be envisioned. This is no longer the case: high throughput sequencing, assisted by incredibly powerful computer algorithms, is now commonplace. And editing any piece of DNA with a great degree of accuracy can be done in almost any laboratory, thanks for instance to the CRISPR method. As a result, the first birth of a genetically modified baby (twin girls, in fact) was reported in 2018 in China. This experiment was almost unanimously condemned all over the world (and the principal investigators were indicted by the Chinese authorities). The three volumes we are reviewing below have been published in 2019, in the aftermath of this event, and in the context of a now realistic feasibility of human genome editing.

Let us start with a double warning:

1. Do not expect from these books any scientific, technical or medical detail about the different techniques of gene editing. None of the authors is a scientist, or a practicing medical doctor; most of them are scholars in either Law or different fields of the Humanities.
2. Do not expect a nicely balanced treatment of the different opinions concerning the issue. One of the authors is an enthusiastic advocate of all forms of gene editing. All the other contributors are more or less opponents of any kind of tampering with the genome, although with different shades of strength of expression.

This initial *caveat* should not deter readers from getting into the depths of the very rich contributions which are gathered in these three recently published books. Depending on our personal stance and knowledge of the issues at stake, we may either find new material for feeding and developing our established opinions, or discover the wide range of arguments we have to address in trying to convince our opponents of the validity of our position. Or, and maybe this would be the best result we can expect from our efforts (since reading and digesting these 840 pages is no easy task), we might come out with a more balanced view of the field, compelling us to discard many of our initial presuppositions and prejudices …

* * *

Jamie Metzl held different offices in the Clinton administration. He holds a degree in Law and a PhD in Southeast Asian history. This expertise allows him to teach the reader of his "**Hacking Darwin**" everything he has always wanted to know about biology, from Mendel's laws to genetic engineering, with of course a special interest in present and future techniques of human gene modifications. All through the book, we are presented with results published in "*high profile papers*" by "*leading biologists*" and "*path-breaking and controversial US scientists*", that describe "*wonder drugs*" and "*miraculous innovations*". These quotes are selected from among many others to give an idea of the general style of the argumentation. One might want to start (and possibly stop) with chapter 6, where Metzl provides us with a perfect account of his scientific creed: "To *many religious people and others who believe in concepts of the spirit and soul, a human being is infinitely complex. […] For those like me, who believe we evolved from microbes, humans are single-cell organisms gone wild over six hundred million years of random mutation and natural selection. We are not infinitely complex beings, just massively complex ones. […] If we are infinitely complex, we'll never understand ourselves. If we're only massively complex, there will come a time when the sophistication of our tools will outmatch our own complexity"*. Everything is a matter of accumulating more and more big data, and improving AI algorithms.

Gene editing is easy, fast, and may produce huge profits (including remediating hunger in the world … ?!). Since it can be used for gene therapy, there is no reason not to go one step further, that is to prevent our children and our societies from getting any disease. And once we are there, why not try and get some improvement in intelligence, strength, life span, artistic skills …. you name it? This is just a more sophisticated way of entering the natural competition which has driven our evolution up to now, and modeled our relation to the environment: "*the moment we started planting crops, clearing fields, and creating medicines […], we were giving the middle finger to nature as it was*". Once the matter of the relationship of man and nature is

disposed of in this remarkably elegant way, the word "ethics" looks quite incongruous. Actually, I could find it only once in the book, in the title of chapter 8.

In summary, as I understand it, Metzl's message about human gene editing is quite simple: "If it can be done, it will be done, therefore it should be done, or the Chinese will do it before you". And the rather weak and vague final call for some regulation is not very convincing: "*We will not be able to stop the genetic enhancement of our species, but we can influence, hopefully for the better, how this transformation plays out.*"

* * *

In sharp contrast with the previous author, **Françoise Baylis** is a recognized practicing expert in bioethics. She is presently a full research Professor at Dalhousie University Medical School. Her PhD in 1989 was about the question of the ethics of research on spare IVF human embryos. Although her list of publications on different aspects of bioethics is quite impressive, "**Altered inheritance**" is the first book she writes as a single author. This makes it a rather special contribution, and the feeling of deep personal involvement is clearly perceptible all over its more than 200 pages.

The first four chapters set the stage, as it were. They take us from the early proposals of gene therapy, in the case of single-gene diseases such as Huntington's disease or cystic fibrosis, to the first real-life example of germline modification using the CRISPR/Cas9 technique. This most disputable experiment, worked out illegally by Chinese scientist Jiankui He, led in 2018 to the birth of twin girls whose CCR5 gene had been modified in order to give them (and, of course, their potential descendants) some resistance to HIV infection. Other ways for selecting and/or modifying the genomes of children to be born, mainly through PGD (preimplantation genetic diagnosis) or pronuclear transfer (in the case of mitochondrial diseases) are described, in clear and simple words, accessible to lay people but without undue patronizing. Some real or imaginary case examples are used to illustrate the technical accounts, which makes the style quite vivid – although with emotional accents that may at length become somewhat irritating …

One main issue is addressed from the beginning: the difficulty of making a clear distinction between "treatment" and "improvement". In the author's view, "*all treatments are enhancements, in the sense that all treatments aim to improve an individual by correcting an actual or perceived deficiency in relation to 'normal' abilities. […]. As such, all human genome editing is a form of enhancement, it is just that some of the enhancements will be health-related and others not. And among those enhancements that are health-related, some will aim to 'treat', while others will aim to 'prevent'* ". Thus no

clear moral or ethical demarcation line may be drawn on the basis of treatment/improvement distinction. In addition, the safety of these techniques is far from being absolutely established. Furthermore, their economic costs will most probably result in a significant increase in social inequity and health inequality.

A historical chapter, interestingly mixing literary works and actual facts, from Mary Shelley's *Frankenstein* (1818) to the birth of the Chinese twins in 2018, introduces the reader to a list of potential benefits and potential harms, both to individuals and to society. It is followed by a 25-page indictment, where various potential wrongs are addressed in succession, from the exploitation of women as "egg providers" (Françoise Baylis is a prominent women's rights defender) to genetic discrimination in insurance, threats to the human genome as our "common heritage", and finally transgression of divine or natural laws.

The second part of the book is devoted to a general reflection on scientific and ethical practices. Baylis distinguishes (in a slightly manichean way) between "fast science", "*driven by personal and commercial interests*", and "slow science", that "*encourages reflection on research policies and practices (competition and secrecy, for examples) to determine whether they promote the common good, and, if so, how.*". This is followed by two interesting chapters where a categorization of scientists and ethicists is proposed. According to Baylis, scientists are either pure scientists, science analysts, issue advocates or science diplomats. Each category is of course widely exemplified. In a parallel way, according to their practice and their ideology, ethicists may belong to the groups of ethics theorists, ethics analysts, issue advocates or ethics architects. While the author is conscious of the over-simplification that this classification entails, she maintains (and we agree with her) that it may contribute to better understanding of the different ways in which science and ethics are practiced in real life.

As a conclusion, Françoise Baylis argues for the absolute necessity that the issue of tampering (or not) with human genome is not left to "experts" (individual or committees), but becomes a matter of "*public empowerment*", hopefully leading to a "*broad societal consensus*". She is of course aware of the difficulties of setting up such an ambitious objective; one possibility she mentions is to use (with all due modifications and improvements) the World Wide Views process of citizen consultations, which has been tested in the field of global warming and biodiversity. Other ways, such as collective discernment as practiced by Quakers, or decision-making by consensus, are also discussed. Whatever the methods, everyone should be involved as an actor. "*This book is a call to action – a call for us to take collective responsibility for our biological future. In answering this call, we need to reflect on what*

kind of world we want to live in, and how we can contribute to building this world".

The main objective of the book is obviously to state – and promote – the author's personal views and opinions. However, she is extremely well informed about everything that has been discussed and published in the field, particularly in the framework of various committees, commissions, councils, advisory groups, etc., either academic or nationally or internationally appointed, in Europe and North America. She actually belongs or has contributed to a good number of them. Many statements from these organizations appear throughout the text, as well as declarations from prominent scientists, philosophers or ethicists. The corresponding references, in a perfectly academic format, are very handily listed at the end of the book rather than as footnotes. A short list of abbreviations, a simple glossary and a quite comprehensive index are also provided.

In spite of – or perhaps because of – its very personal tone, this book is rather pleasant to read, and very informative as well. No one has to agree with Françoise Baylis about everything, but her view-point certainly deserves to be considered, and her expertise put to good use for constructing one's own personal opinion.

* * *

"**Human flourishing in an Age of Gene Editing**", in contrast to the preceding two works, is a multi-author volume, presented as the outcome of a Hasting Center project led by the two editors of the book and the Center's president, Mildred Z. Solomon. The Hasting Center, established in 1969 in New York State, defines itself as "*a nonpartisan, nonprofit organization of research scholars from multiple disciplines, including philosophy, law, political science, and education.*" Twenty different authors have contributed to the book, in 17 short chapters (from 11 to 20 pages, including 1 to 4 pages of notes and references), arranged in 5 sections. Since the entire volume is about the notion of flourishing, some degree of redundancy is inescapable. However it is kept to a minimum, thanks to the very careful editing process managed by Erik Parens and Josephine Johnston, that is apparent for instance in the numerous cross-references between individual articles. The theme of human flourishing is wide enough, anyway, for each author to have the opportunity to present his/her own approach, on the basis of personal experience and academic expertise and interests.

In the first part, "What is human flourishing", it is already apparent that such a complex notion cannot accommodate a simple definition. It has to be approached from different sides and view points, so that its many different

shades of significance may be woven together into a large and polychromatic canvas. The opening chapter, by Rosemarie Garland-Thompson, deals with the question of "disability" as a perceived obstacle to full human flourishing. From her personal experience of such a condition, and from many other examples she intimately knows, she draws the conclusion that the main issue is "*the contours of the world into which one is born*" rather than the physical (or mental) distance to a supposedly "normal" model. She draws on Habermas' thinking to reach the following formula: "*To flourish is to grow over a lifetime into a particular rather than generic individual human person*". It follows that "*flourishing depends not so much on what our individual human variations might be but rather on whether the collection of characteristics that make up our distinctive being develop in harmonious relation with the environment*". Thus, instead of attempting to shape individual bodies, it would be better to realize that society itself should be intentionally and ethically shaped.

In the next chapter, philosopher Daniel Haybron starts with a short listing of the different ways flourishing – or well-being – can be understood. Well-being may be a subjective notion (as in hedonism or "desire-fulfillment theories") or described in an objective way such as possessing a definite list of items, or as "nature-fulfillment" (with nature understood in its Aristotelian meaning), or, more generally, self-fulfillment. Authenticity is another word for self-fulfillment, and it means that persons count, and "*should be treated with respect, as ends in themselves and not as mere means*". Authenticity supposes that "*the self be truly one's own and not the product of another will*". Therefore, the essential question is what kind of threat (if any) gene editing techniques represent to authenticity. It is discussed extensively in the last five pages of the chapter.

Next, John H. Ewans, as a social science scholar, introduces the distinction between what he calls "thin" and "thick" ethics. According to this definition, thin ethics takes into account only the three principles of beneficience, autonomy (or self-determination), and justice (avoiding social inequalities). It is exemplified in the 2015 International Summit statement on human gene editing, which Ewans considers as utterly lacking in depth. Ewans calls instead for the inclusion of other principles, such as flourishing, dignity and naturalness, so that the debate may become really "thick". He argues that thin debate is preferred by bureaucratic states (in the US, for instance) because of "*the lack of trust in government to exercise moral judgments [that would] apply universally to all citizens*". In addition, he considers that "*over the years public bioethics and bioethicists have lost their independence from science*". Thus, an independent institution "*outside the aegis of both the scientific and mainstream bioethics community*" is urgently needed. Other authors in the volume will refer to this notion of "thickness" in ethical reflections,

even if they do not necessarily espouse Ewans' stance about liberal political thinking.

What does "editing" really mean, in the context of the human genome? The question is addressed in a short but very interesting chapter by philosopher Michel Hauskeller. He remarks that "*the editing metaphor suggests that the genome is not the finished product, but rather like the draft of a text*". In the case of the genome, it must be acknowledged that nature is the original author, whose voice (and choice) has to be respected. Correcting "spelling mistakes" may be admissible, but what about attempting to enhance the text so as to make it more presentable to the target audience? There is no "best possible human being", instead there are many different ways of being good.

Unsurprisingly, oriental philosophies have their say in the matter of human flourishing. Here, Richard Kim develops the way the Chinese Daoist tradition seeks to achieve human fulfillment, or well-being (which he takes as a synonym). On the basis of a thorough analysis of the Zhuangzi (one of the classical Daoist texts), he comes to the conclusion that any kind of genetic modification technique, whether intended as therapeutic or as enhancing, would be unacceptable in this tradition, since they would appear as contrary to its two central elements, namely "*heavenly perspective*" and "*the virtue of spontaneity*". Kim is quite ready to acknowledge that such a vision may seem exceedingly radical. But he argues that Zhuangzi "*may be a resource to help us to examine some of our most basic – and therefore least analyzed – assumptions.*", so that we get "*less likely to become imprisoned by the particular values of our society and culture*".

References to "naturalness" (or "unnaturalness") are frequently used as ethical arguments in the context of genetic modifications. The concept of nature is a little deceptively self-evident, as shown by its spontaneous use by Rebecca, the ten-year old daughter of Gregory E. Kaebnick. The chapter he writes is an elaboration on this notion, where nature is considered both as "outside" ourselves (the environment) and as something we belong to, and which gives our life meaning and structure. I would have welcomed a more systematic treatment of this question, since it plays a central role in controversies about human gene modifications. Here, we are left with the proposal that nature may be seen alternatively as a "rule book", with reference to the controversial idea of "natural law", or as "something we should care about". Of course, some kind of balance has to be found between these two approaches, with implications both on the personal ideals and the societal obligations.

The next part of the volume is dedicated to the difficult question of choice. Sheena Iyengar and Tucker Kuman, from Columbia Business School, ask whether having more choices really leads to more flourishing. Interesting

psychological studies show that, in real life, to be presented with too many different options is often confusing, and that people tend to prefer situations where the panel of choices is reduced. This quite well-known result is used to illustrate how a putative (and somewhat far-fetched) "genetics supermarket", where prospective parents are offered the chance to select all kinds of characters for their future child, is likely to lead to painful ethical dilemmas – and probably to an actual loss in personal freedom and responsibility, since institutions and governments will have the duty to exert some control on the choices, either forcefully or through insidious "nudging".

This questioning is developed by Josephine Johnston, from the point of view of parents (actual or prospective). Gene editing technologies, once they are really safe and practically effective, are supposed to prevent harm and disease to the children to be born, and/or provide them with some competitive advantage. Therefore using them may become a tenet of "good parenting", insidiously becoming a norm that drastically reduces parents' freedom of choice. In addition, one has to consider the multiple burdens on parent's well-being that would very likely ensue: necessity to use IVF with all the attached physical hardships for women, financial costs, ethical conflicts, etc. There is obviously a "*potential clash between the best interests of future children and the flourishing of prospective parents*". Therefore, according to Johnston, "*good prospective parents not only have responsibilities to future children, but also have obligations to themselves. The burden that gene editing could place on them – including pressure to eschew their own values and act in ways that are inconsistent with their flourishing – are relevant considerations in their decisions about whether and how to use gene editing technologies*".

Following in this track of reasoning, Nicole A. Vincent and Emma A. Jane imagine a world in which "*a range of social pressures, rather than a felt sense of parental moral obligation, […] lead most, if not all, parents to use genetic screening and intervention technologies*". These potential pressures may be not only social, but economic as well, if the costs of medical care and insurance are taken into account. This points to the necessity of establishing appropriate social institutions in order to "*oversee, evaluate, and control the social factors that influence individual people's decisions*". A prerequisite to such an evaluation is a sound reflection on what should be considered as "normal", in order to clarify the somewhat blurry distinction between treatment and enhancement. After all, as already mentioned for instance in the first chapter of the book, it is a fact that "*many people with serious and persistent disabilities report experiencing a good or excellent quality of life*".

In an avowed feminist point of view, Jackie Leach Scully asserts that self-determination is actually grounded on interpersonal relationships of responsibility and dependence. She examines empirical studies, conducted in the

UK between 2002 and 2014 in dialogue groups where the ethics of using reproductive technologies were discussed. As could be expected, a deep ambivalence about the values of reproductive choice was found among the participants. In parallel, the attitudes toward disability were quite divided. The author concludes that "*the good life is not dependent on our ability to* control *everything that happens to us, but on our ability to* respond *with appropriate adaptability*". In the field of parental reproductive choice, it is necessary to find an equilibrium between acceptance and control, since acceptance is as much a constitutive part of parenthood as control is.

If (or when) germline modification becomes technically and economically feasible, one concern is that it will lead to some kind of "normalization", thus reducing the degree of diversity of the human population. But what kind of diversity are we talking about, how can it be measured, why should diversity be considered as good *per se*, and whom does diversity actually benefit? All these questions are discussed thoroughly in an interesting and rather balanced way by philosopher Robert Sparrow, who argues for a moderate approach to conservation or promotion of genetic diversity, without neglecting individual welfare. He very usefully reminds us that "*promoting the flourishing of the community or the species by sacrificing the welfare of individuals treats the individual as a means to secure a benefit enjoyed by others. This willingness to sacrifice the welfare of individuals for the sake of the collective was one the hallmarks of the morally disturbing eugenics programs of the past*".

As a Christian theologian, Michael Burdett sees human flourishing as depending on two elements of human existence: "creaturehood" and "deification". The Christian vision of the human differs radically from the transhumanist and the liberal humanist visions in its belief that humans are creatures made by God (creaturehood) and that they are "children of God", thus participating in some of God's characteristics (deification). This provides a firm grounding for the notion of human dignity, without having to resort to some more or less controversial structural or relational component of human nature. Rather than producing simple answers, the interplay and tension between creaturehood and deification must be seen as a starting point for a robust vision of the human, that can guide us in the debates about gene editing. Burdett postulates that this framework is not necessarily restricted to believers, and that it may also be recognized as having substantial heuristic value outside religious contexts.

Inviting scholastic philosophy to the debate on gene editing may look like an anachronism. Biologist-theologian Celia Deane-Drummond, however, thinks that Thomas Aquinas' concept of "beatific vision" can be used to shed some light on what "human flourishing" really is. It has to do both with the Daoist "heavenly perspective" and to the Christian "deification" that have been

mentioned in preceding chapters. Beatific vision is the final goal of human life, accomplished as an effort to become like Christ, and perfected through suffering. It is received by grace, just as theological virtues of faith, hope and charity are. For believers, beatific vision may inform "practical wisdom", which is useful in the conduct of ordinary human affairs. According to Aquinas, practical wisdom has eight qualities: memory, teachability, acumen, insight, reasoned judgment, foresight, circumspection and caution. The implementation of these eight qualities is discussed in the particular context of gene editing, at the individual and collective levels. As an example of their use, an interesting discussion of the dangers of emotive and anecdotal arguments is presented. Practical wisdom is definitely "*not a panacea, but it may be an important alternative to the idea that all we need to do is to apply fixed principles such as respect for individual autonomy*".

In the last part of the book, "Flourishing together", the stress is put on social and political issues rather than on individual choices. Dorothy Roberts questions the way "mainstream concepts" are too easily taken as self-evident, and lead to an assumed conception of human well-being that overvalues the traits of socially advantaged groups. It is clear that editing genes will not change structural inequalities, even if it becomes widely accessible to all; it would probably be more useful to recognize that improving social structures is the key to improve the lives of people with disabilities. As John Evans did in a previous chapter, Roberts calls for a "*truly thick debate*" that "*include socially disadvantaged groups, whose traits are devalued and who have a greater stake in social change*".

The matter of public good *vs.* private choice is an essential element of any ethical judgment. As such, it must definitely be taken into account in the debates about reprogenetic technologies (including everything from current prenatal screening and preimplantation genetic diagnosis to emerging techniques such as prenatal whole-genome sequencing and possibly germline gene editing). Maartje Schermer reminds us that individual choices always have a collective impact – for instance by leading to a shift in accepted norms of normality and health. Everyone will probably agree that public good is more than the mere sum of individual goods or well-being; it also entails social justice, which ensures that these goods and well-being are distributed fairly. In a very pleasantly balanced way, the author discusses the potential contributions and threats to public good that may be brought by reprogenetic technologies. She concludes with several references to reports issued from 1994 to 2003 by the Health Council of the Netherlands. I think they deserve to be quoted at length - especially since Schermer's contribution is the only Continental European one in the entire volume …! According to the Dutch Health Council, which has been officially established to advise the government, "*it is one of the tasks of the State to investigate threats to the public*

good, and if necessary to consider what policy measures can be adopted to protect it." Personal freedom should not be arbitrarily limited, even if government programs may be installed to promote or to discourage certain applications. But "*in order to make individual choices possible, social solidarity is needed with those who are confronted with these choices*". Therefore "*facilities and conditions for care, support, and integration of people with disabilities must be guaranteed. It is an important task of the government to promote and monitor this*". Without such societal conditions in place, reproductive choice is not really free and self-determination is limited.

Human dignity is a central tenet in all bioethics debates, including – but not restricted to - interventions of all kinds on the human genome. Gaymon Bennett attempts a short historical account of the way this concept has been progressively elaborated, with special emphasis on the role of the UN Commission on Human Rights, on the one hand, and of the Catholic Church, on the other. He asserts that "*The Vatican and the United Nations both offered what has been called an '*archonic*' view of human dignity because it is simultaneously primordial and normative*". The contemporary idea of human dignity was born, according to Bennett, "*in response to the perceived excesses and deficiencies of modern forms of power*", and, more specifically, "*as a critical response to what has been called '*biopolitics*' or sometimes '*biopower*'*". Biopolitics is concerned with "*the potential of science and technology to renormalize human life through technical and political intervention*". Although it is not intrinsically nefarious (see its achievements in increasing longevity and reducing morbidity), it has no internal principle of self-limitation, and if left unchecked may result in increasing the vitality of some at the expense of others. A proper consideration of human dignity provides a fundamental tool for setting up a necessary "counterpolitics".

Biopower is the target of Bruce Jenning, in the last chapter of the volume. He sets up a rather simplistic opposition, which borders on caricature, between two different worldviews: the "mechanistic" and the "holistic". The mechanical worldview "*is material, empirical, reductionist, and objectifying*". It "*orients human aspiration and agency toward reshaping and reengineering nature*". In contrast to this evil way of considering our perception of the world, more or less grounded on Cartesian and Lockean dualism, the holistic worldview "*revitalizes an idea of unity, reminiscent of Aristotelian thought*". It allows the establishment of "*communicative communities*", and the flourishing of moral subjects, acknowledging the interdependence among all human and nonhuman beings. Membership and mutuality are the keywords of such communities: "*their common ethical ground is the valuing of others by the self (respect) and the valuing of the self by others (social esteem)*". In other words, "*membership confers standing; mutuality enables standing*

together". Their convergence point is solidarity. Biotechnological progress should always be considered and assessed in the context of these values.

This firm conviction is an appropriate conclusion – as well as a summary of sorts – for this extremely rich sum of contributions. I should stress, lest this rather lengthy review may induce some reluctance to launch oneself into reading the whole volume, that each chapter is self-standing, and may be read independently of the others. But my guess is that you will become rapidly aware of the global coherence of the work, and that you will end up with no part of it left unread …

Book Reviews

Brian Greene, *Until the End of Time: Mind, Matter and our Search for Meaning in an Evolving Universe*. London: Allen Lane , New York: Random House (2020) 429 pp.: ISBN 978-024129-598-4 (Hdbk) $30.

Brian Greene, one of the world's foremost string theorists, heads the Centre for Mathematical Physics at Columbia University, New York. He has previously written several compelling expositions of modern physics for the (highly intelligent!) lay reader. This latest book's eleven chapters, though not formally divided, effectively fall into three groups. The first four chapters, close to the vein of the previous books, provide a pacey stride through both the physical and biological worlds as currently understood by physicists. The next four have a more relaxed pace, reflecting philosophically upon human life. The final three chapters return to physics, ever more wildly speculating upon the long-term fate of the universe.

To go into somewhat more detail, Chap. 1, *The Lure of Eternity* (one of the shortest chapters, despite the massive reach of its title), toys particularly with our sense of time, and therefore of eternity. Chap. 2, *The Language of Time*, stresses the importance to us of mass properties, rather than those of individual molecules, and thus approaches statistical laws, especially those of thermodynamics. Chap. 3, *Origins and Entropy*, refines the concept of entropy in considering the Big Bang, regions of order formed at the expense of increased disorder elsewhere, and the effects of gravity on large volumes of matter. And Chap. 4, the longest of this group, entitled *Information and Vitality*, and making frequent genuflexions to Schrödinger's 1943 book *What is Life?*, manages to consider energy processes in both plant and animal cells, DNA, RNA, the origin of life, and Darwinian evolution both in living systems and in pre-biotic ones. To quote from half-way through this account (p. 107), "Life is physics orchestrated". As a physiologist, I was particularly drawn to this chapter.

We now come to the four chapters which I characterised above as less pacey, more philosophical. This is abundantly the case in Chap. 5, *Particles and Consciousness.* Though representing himself as an out-and-out reductionist, Greene nevertheless has recognised earlier (p. 72) that "Even the staunch reductionist realizes that, as fatuous as it would be to explain a baseball's trajectory in terms of molecular motion, it would only be more so to invoke such a microscopic perspective in explaining what a batter was feeling as the pitcher went through his windup, the crowd roared, and the fastball approached. Instead, higher-level stories told in the language of human reflection provide far greater insight". Gradually, in this new chapter, he approaches that goal. Referring (p. 125) to Nagel's *What is it like to be a Bat?*,

he recognises that "Even if we had a complete accounting of all the underlying fundamental physics, chemistry, and biology that make a bat a bat, our description would still seem unable to get at the bat's subjective 'first- person' experience. However detailed our material understanding, the inner world of the bat seems beyond reach." And of course "What's true for the bat is true for each of us." The ensuing pages cover a range of ideas, floated by other thinkers, including the suggestion that all the particles of the universe embody some degree of proto-consciousness. "If you're wondering what proto-consciousness really is or how it's infused into a particle …. your questions are beyond what anyone … can answer. …. [But] if you asked me similar questions about mass or electric charge, you would likely go away just as unsatisfied. I don't know what mass is. I don't know what electric charge is. What I do know is that mass produces and responds to a gravitational force, and electric charge produces and responds to an electromagnetic force. So, while I can't tell you what these features of particles are, I can tell you what these features do" (p. 133). Wonderfully tolerant! The discussion then moves to include the widely canvassed notion that quantum uncertainty underlies the puzzle of consciousness. But Brian Greene will have none of this: "Our choices are the result of our particles coursing one way or another through our brains" (p. 147). So are our movements, and our thoughts. This is absolute physicalism – "phooey" to freewill! But, with great respect, I take issue with that dismissal. What matters to me is that, unless I am under external constraints, what I decide to do, I do. The determinist's picture, as usually painted, implies that physical law will make me do much that I don't want to – that I shall act against my own will. Such a picture overlooks what "I" consist of. I consist of the sum total of all the influences which have acted on me, at whatever level they may be described – particles, cells, hormones, neurophysiology, genetics, upbringing, what I had for dinner. They all come together to comprise me, at a particular moment. That me, that "I", decides to act in a certain way, and no external force opposes. Historical and external forces have indeed shaped the "I", but *it is that "I" which decides the action*.

It is clear later that our humane and civilised determinist author really understands this: "At any given moment, I am my collection of particles; 'I' is nothing but a shorthand that signifies my specific particulate configuration" (p. 157). However, caught up in his own commitment to reductionism he falls just short of recognising the philosophical implications of this point. Yet doing so is surely VITAL?

In Chap. 6, theories of the origins of language and of story-telling are explored, though with the comment that there is less consensus on these topics than on the early stages of the universe. Chap. 7 looks sensitively at *Brains and Belief*. It pays considerable attention to the cognitive scientists of religion, such as Pascal Boyer and Jesse Bering, but ranges widely to draw upon

pre-historical finds, the Vedas, the Old Testament (Greene's upbringing was Jewish), a striking debate with the Dalai Llama, and his own response to the Jewish rituals at the time of his father's death. He concludes, much like William James, that "if religious practice – or perhaps a better label here would be spiritual practice – is undertaken as an exploration of the mind's inner world, an inward-directed journey through the inescapably subjective experience of reality, then questions of whether this or that doctrine reflects an objective truth become secondary" (p. 217). Chap. 8, *Instinct and Creativity*, places great weight on the wordless significance of music; this notably for Einstein, whose edifice of Relativity was based on no new facts but relied on "imagining a simple but fundamental rearrangement of the Lego pieces of reality" (p. 232). So ends what I regard as the middle section of the book.

The final one begins (Chap. 9: *Duration and Impermanence*) by starting us on an imaginary climb of the Empire State Building, with each floor representing a period of the earth's history ten times longer than the floor below. We are currently a few steps above Floor 10, but the rate of change is exponential. Only one full floor higher, repulsive gravity and increasing dark energy could blow the whole universe apart in a "Big Rip". But if dark energy does not increase, it will be worthwhile to climb several floors higher, where more restrained yet still accelerating expansion has taken most galaxies out of our sight, leaving the sky predominantly dark. If the earth has escaped being consumed by the sun's expansion, by floor 15 its surface will be deadly cold, but life in oceanic thermal vents will be kept warm by deep-core nuclear fusions. On floor 23, however, having dissipated its kinetic energy in gravitational waves, the earth will sink into the cold, dark sun. The thought-trip continues many floors further, but the contact with the world we know becomes exponentially more remote with every floor, so that in Chap. 10 (*The Twilight of Time*) Black Holes disintegrate, the Higgs Field changes value, and bodiless brains, first contemplated two generations ago by Freeman Dyson, can form. Finally, in Chap. 11, *The Nobility of Being*, our author reflects (p. 323) "how utterly wondrous it is that a small collection of the universe's particles can … examine themselves and the reality they inhabit, determine just how transitory they are, and [yet] with a flitting burst of activity create beauty, establish connection, and illuminate mystery. …. We are ephemeral. We are evanescent. Yet our moment is rare and extraordinary, a recognition that allows us to make life's impermanence and the scarcity of self-reflective awareness the basis for value and a foundation for gratitude." The *tour de force* has run its course, and ends by recognising human value, perhaps unique to the present epoch.

Not that the book strictly ends here, for there are nearly 60 expansive pages of notes, many of them exploring the basic ideas of the main text in more

detailed, sophisticated, and sometimes mathematical ways. And final credit must go to a fine index, of more than 20 pages.

A book not to everyone's taste, but beautifully written and exceptional within its *genre*.

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Elaine Howard Ecklund, *Why Science and Faith Need Each Other. Eight Shared Values That Move us Beyond Fear*. Grand Rapids, Michigan: Brazos Press 2020, pp 176; ISBN 978-1-58743-436-5 (Pbk), $ 17.99

This is an amazing book. And the author, Elaine Howard Ecklund, has chosen a very unusual and creative way of showing why science and faith need each other.

Ecklund (PhD, Cornell University), a well known and high ranking professor of sociology at Rice University, where she holds the Herbert S. Autrey Chair in Social Sciences, has founded a Religion and Public Life Program there.

Sociology and Social Science are definitely under-represented in the dialogue between Theology and Science. But in this book it becomes clear how much these disciplines can add and bring in new and helpful points of view.

First of all Ecklund's research as a sociologist does not start from scientific results and research in Theology and Science but sheds light on the views of scientists and people of faith. And this handy book brings together her scholarly insights and personal stories. In this she is trying to show how Science and Christianity intersect in constructive, even beautiful ways. In fact she is also writing what I would call an "apology for people of faith becoming passionate about science". And on purpose she therefore, already in the book title, uses the word "faith" and not "religion" or "theology". And step by step develops a convincing plea that faith and science are not opposing forces.

The book, made possible through the support of a grant from the Templeton Religion Trust, has three parts on "Building Blocks", "Process" and "Redemption". Very helpful are the suggestions for further reading, listed chapter by chapter from page 159 onwards.

Let me start with chapter 9, "Awe": "Many scientists talk about how seeing the beauty of the natural world through their work fills them with a sense of wonder and awe, which they hold in high value" (p. 123). Ecklund refers to

Christian, agnostic and atheist scientists who nevertheless all share a deep curiosity, often bringing in deep awe as well. Richard Dawkins for example writes of a "deep aesthetic passion to rank with the finest that music and poetry can deliver" (p. 124 – Richard Dawkins, Unweaving the Rainbow: Science, Delusion, and the Appetite for Wonder. Boston: Mariner, 2000)

Ecklund suggests, to bring scientific awe to church and to discuss with scientists in churches, how their exploration of the natural world deepens their understanding of creation.

As in all the 11 chapters Ecklund here suggests a few themes and questions for further consideration, and, very practically, for discussion in groups.

> "The first three chapters of this book tell us about building blocks of virtues – how virtues are born in our communities and are part of what it means to be human. Starting with chapter 4, this book explores eight key virtues of Christianity – curiosity, doubt, humility, creativity, healing, awe, shalom, and gratitude – and how these virtues are practised in the scientific community. The virtues of curiosity, doubt, humility, and creativity are crucial to the scientific process and, I argue, ought to be a core part of Christian communities. The virtues of healing, awe, shalom, and gratitude reveal how science and faith come together in redemptive practices.
>
> "This book aims to show Christians the values they share with scientists, how Christian scientists see religious values in their scientific work, and how Christian communities might draw on virtues they share with the scientific community to better connect with science and scientists" (p 21).

Part 1: Building Blocks:

In the first chapter of this block, "From Fear to Understanding" Ecklund looks back on the last 15 years of her studies. In total, she has surveyed nearly 41,000 religious believers and scientists (believers and non-believers). She makes it very clear from the beginning, that this book also deals with her personal lifelong question and that she thinks science and faith do address the biggest and most important questions of life. Ecklund is proposing a new approach for discussing the relationship between science and faith in that she sees science and faith not just as sets of ideas but as groups of people. She is further convinced, that scientists and Christians share common virtues, which will lead to common ground once brought to light.

In chapter two, "Overlapping Communities" we learn that many Christian scientists practice a "secret science" and do not talk about their work and research at church and with other Christians. In the US – and this might well be the case in not a few European countries as well – there are still quite a number of Christians, especially of Evangelical Christians, who view science and religion as in conflict. On the other hand the clear majority of Christians and especially of Christian scientists think that science and religion can

support each other and collaborate – for example in that science and faith could fill gaps the other may leave or provide solutions for questions the other cannot answer. Communities play an important role since humans tend to judge people they perceive as similar to themselves as more moral and trustworthy. But, Ecklund concludes, we have to engage groups we think of as "the other" in a genuine way in order to have a real chance of crossing boundaries and changing minds.

Chapter 3 on "Creative Evolution: Moving Past the Origins Debate" is about the questions of origin, of ourselves and of the world around us. Instead of just asking whether a person believes in creationism or evolution, Ecklund invited her interview partners to choose from six explanations (narratives) for the origin and development of life on earth. The results showed that many scientists accept evolution while also maintaining that a creator God played some role. And while young-earth-creationism was the most popular narrative among evangelicals, nevertheless almost 40 percent of them were not willing to commit to any single perspective. Some argue that the final origin is a mystery and not infrequently hold contradictory views on human origins. Some would accept evolution with a divine first cause, some think God can continue to be involved in the process of evolution. On the other hand some scientists see orderliness in evolution and believe it displays the fingerprints of God.

For Ecklund, Christians take the concept of evolution in that it shows that humans are special (as is the case in the concept of *imago Dei*). And evolutionary scientists and Christians can join together in recognizing the importance of curiosity and creativity for humanness.

Part 2: Process

Of the eight key virtues of Christianity already mentioned, in this part curiosity, doubt, humility, creativity are taken up and the attempt is made to show how these virtues are practised and even are crucial in the scientific community and ought to be a core part of Christian communities.

Ecklund writes: "It is time we honoured curiosity about science in church. Interpreted from a Christian perspective, science can be seen as a tool to pursue knowledge and truth about creation and to better understand the words and works of God and how we can live better lives" (p. 62).

With Mario Livio she differentiates between "epistemic curiosity", a desire to learn new knowledge, and "perceptual curiosity", as the curiosity we feel when something surprises us or does not agree with what we know or think we know. Many Christians are indeed curious about the relationship between their faith and science and how to integrate one with the other. This can be painful and stressful but to satisfy it can also feel like receiving a reward.

As to doubt, conventional thinking is that science relies on reason and evidence and religion on faith. In the scientific community indeed doubt is not only useful but essential. In quoting Merton, a sociologist from Columbia, Ecklund introduces what he called "organized scepticism". But doubt also can be seen as possibly leading to more robust faith as for example in Anselm of Canterbury's dictum *fides quaerens intellectum*, a theological method stressed earlier by Augustine. As a devoted Christian herself and coming from a Baptist family, Ecklund through her personal history and life with scoliosis has experienced doubt as to faith and science. But she has also been moving past conflict and become what she calls a "boundary pioneer".

> "I think we need to show how science can bolster faith (which is not the same thing as certainty). The boundary pioneers – scientists who are committed Christians and who break down the boundary between science and religion, those who live in both worlds – are our models. They show us that scientific evidence has actually opened up their faith to mystery and awe" (p. 72).

On the other hand those scientists often also see faith as adding meaning to their discoveries.

Practising doubt as a virtue can lead to humility. Scientists who practise humility hold their findings as preliminary, recognizing that they might be wrong. They know that the kinds of truth underlying nature transcend the most powerful minds – as Nobel-Prize winning physicist Subrahmanyan Chandrasekhar pointed out. As Ecklund puts it: "From my own studies and experiences in science, I have seen that intellectual humility and hospitality as well as relational humility – embodying kindness and respect for the ideas of others no matter their status – go hand in hand" (pp. 85f). Therefore Ecklund strongly suggests that Christians should model humility themselves, a virtue at the core of their faith. Christians should recognize that all humans are imperfect in their knowledge, and embrace a recognition that there is much to learn from beliefs different from their own and that there is much science can offer faith and their understanding of the world without undermining it. "By taking a humble approach, we can begin to build bridges between science and faith" (p. 91).

Many of the Christian scientists Ecklund has interviewed think that science itself is evidence of God's creativity. Others would say that creativity is the key way that humans are made in God's image. Very concretely, this leads Ecklund exemplarily and out of personal experience to a strong plea for assisted reproductive technologies and gene-editing technologies: "Sometimes we have to wrestle with our technologies … to make hard choices between theological ideals and competing values. We have to think about what the limits of scientific creativity should be…One part of exercising responsibility

with our God-given creative power is using it for redemptive healing" (p. 106).

Part 3: Redemption

For Ecklund, as we have already seen, the virtues of healing, awe, shalom, and gratitude reveal how science and faith come together in redemptive practices. And redemption is what part 3 deals with.

We started this review with the chapter on "Awe", i.e. chapter 9.

However the first chapter of part 3, chapter 8, is about "Healing". It starts very personally again, with Ecklund's daughter telling her parents that some kids called her mother's hands really weird-looking – a result, Ecklund explains, of joint degeneration from rheumatoid arthritis not only giving her pain for thirty years but also often leading her to hide her hands at school or even on her wedding day. She then goes on to her research, writing: "My research shows that members of both scientific communities and religious communities place high value on alleviating the suffering of others" (p. 112).

What follows in this chapter is a discussion of how humans should offer healing and when they should prioritize alleviating suffering above other core commitments and values – let me add, this being a very pertinent discussion in times of crisis and indeed pandemic.

Reducing suffering is a shared hope and value of both faith/religion and science, but scientists as well as religious persons know that there are also moral risks in alleviating suffering. Some might say that there is opportunity in both crisis and suffering. Others might argue that one's own suffering opens one's heart to the suffering of the world. There is no way to live a life completely free of risk. And of course there are scientists, believers and non-believers, who want to do scientific work that improves the common good, though none of them believes that science can fix all the problems of the world.

Chapter 10 is about Shalom. And although one would wish to have a deeper explanation why Ecklund is using this rich term so typical for Jewish faith and spirituality and why she is using it to explain her habit of regularly trying to "become still", this chapter nevertheless is very worthwhile reading: "As a sociologist, the twin virtues of shalom and stewardship and their related virtue of justice are ones that I have pondered a lot" (p. 135).

Taking shalom as a virtue Ecklund, sees a clear analogy with compassion as in Jesus' solidarity with the marginal ones, and that this is not to be seen as a personal emotional reaction but as a public criticism. As she sees it, this critical awareness of what might be wrong in the social context is to be found all over the world in different religions and in scientists from different religious and cultural backgrounds. This may be expressed in their battle for peace and

justice but also in stewarding the environment. "Those who have been and are most marginalized in our society are often deeply compelled to fight against structures that marginalize others. One of the best ways to encourage Christians to enter science might be to frame science as a calling that provides an avenue for stewardship" (p. 143).

Christian and non-Christian scientists and followers of Christian and other faith(s) then might build up wholeness through diversity.

The last and final chapter of this book is on Gratitude. Ecklund calls this the "parent of all virtues", referring to Psalm 145.3. She finds this conviction in Greek Philosophy, in Christianity, in religion in general and not the least in science as well. Gratitude helps resilience to grow. It allows some scientists to feel that they are having a positive impact on God's creation. And it helps Christians to become grateful for science and scientists as well.

Let me end with Ecklund's last two sentences: "Indeed, my gratitude for both faith and science has compelled me to study faith communities and scientific communities and to endeavour to give back to both of those communities. *And because of this gratitude I can say that my work is part of my worship*" (p. 156).

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Johan de Smedt and Helen de Cruz, *The Challenge of Evolution to Religion*, Cambridge: Cambridge University Press, 2020, 75 pp. ISBN: 9781108716048. 15£.

1. Conflict and complexity: evolution and religion

One of the most contentious areas of the science and religion debate concerns evolution. Many assume that there is an irreconcilable conflict between evolutionary theory and religion. Consider for example the infamous debate in 2014 between Bill Nye, "the science guy", and Ken Ham, founder of "Answers in Genesis", a Christian creationist organization. Events like these, where science and creationism (an anti-evolutionary thesis) are pitted against each other, make for good entertainment. Moreover, the last century has in the US seen many conflicts between fundamentalist Christianity and the educational system over the issue of evolution. But those interested in finding a more nuanced understanding of how science and religion relate ought to look elsewhere, since the conflictual relationship between evolution and

creationism is not representative for the relationship between science and religion in general. If anything can be said to characterize this relationship, it is complexity, argues for example the historian John Hedley Brooke. As he puts it, "there is no such thing as *the* relationship between science and religion. It is what different individuals and communities have made of it in a plethora of different contexts" (Brooke, 2014, 438). This view ties in well with the aims of Johan de Smedt and Helen de Cruz in their Cambridge Element, called "The Challenge of Evolution to Religion" published this year. This book does not aim to find *the* relationship between evolution and religion, but, harking back to Brooke's complexity-view, to investigate how *specific aspects of evolutionary theory* and *specific aspects of religion* relate (p.7). Such an investigation is clearly relevant, not only because of the need for more nuance in debates but also since earlier works in this field risk becoming outdated, given the rapid developments in the evolutionary sciences. So, how might evolution challenge religion? Let us look closer at this new introductory work in science and religion.

2. An outline of "The Challenge of Evolution to Religion"

"The challenge of evolution to religion" contains 4 chapters, including an introduction, which puts current discussions in a historical perspective. Johan de Smedt and Helen de Cruz delineate three ways in which evolution poses a challenge to religion and then discuss ways in which religious philosophies might address these. The first concerns *teleology*, which is covered in chapter 2. The theme here is the tension between the teleology inherent in many religious worldviews and the largely non-teleological outlook in the evolutionary sciences. Both historical and contemporary theistic models dealing with teleology are introduced. The second challenge arises from the tensions between religious and scientific accounts of *human origins*, which chapter 3 covers. A central issue in this chapter is how an evolutionary account of human origins can be related to the Christian doctrine of original sin. For example, as the authors state (p.38), genomic evidence shows that there clearly were no historical Adam and Eve. Furthermore, in the paleoanthropological record, there is not "any evidence for a historical fall or for a period of original righteousness" (p.39). Theistic models addressing these issues are then discussed. The third challenge concerns evolutionary explanations of religion, which create worries that explaining religion undermines or "debunks" religious beliefs. Chapter 4 addresses this. It introduces research in the cognitive science of religion (CSR) and then discusses three versions of evolutionary debunking arguments (EDAs), which aim to debunk religious beliefs in light of such research. In a concluding section, de Smedt and de Cruz state that in light of the current state of the evolutionary sciences as well as the philosophical and theological literatures addressing them, there are some serious tensions to be reckoned with. Furthermore, some notable past attempts to harmonize evolution and religion are no longer feasible. However, the

authors state, the religious, philosophical traditions also contain important intellectual resources to address many tensions. According to the authors, this conclusion applies especially to Christianity and Judaism (p.62).

3. Schleiermacher, Islam and the principle of safety

According to De Smedt and De Cruz, religion has helped bring about science, but science now in some cases challenges religious ideas. For example, the Christian doctrine of the fall has contributed to the assumption that our senses are not reliable and that empirical science therefore is needed, but findings in paleoanthropology now undermine the idea of the fall, at least given some central interpretations of it (pp.1-2). In section 3.5.3, the authors investigate this further, charting Christian interpretations of the fall, e.g. those of Augustine and Friedrich Schleiermacher. A particularly interesting discussion here looks at Schleiermacher's view of how sin, even though it has a biological component, is transmitted socially. What makes this interesting is how the authors relate this view to contemporary work in gene/culture co-evolution, where it is a central idea that both biological propensities and culturally transmitted information are necessary to explain phenomena like morality (pp.41-43). This discussion indicates that religious ideas about sin do not necessarily conflict with evolutionary science, a point which is highly relevant given the polarized nature of many science-and-religion debates.

Apart from making some brief forays into how Jewish and Hindu scholars have responded to evolution, this book is largely devoted to relating evolution to *Christian* ideas. Such a restriction is understandable given the brevity of the work. But I do find these forays welcome and wish there had been more of them. Given how dominant Christianity is in much of the science-and-religion literature today, more discussion of other religions would have strengthened this work, which, after all, is presented as a book about evolution and *religion*. The authors briefly mention Maimonides' (Moses ben Maimon) criticism of Islamic perspectives on stochasticity, the idea that things happen by chance (20-21). However, it would here be interesting to hear what responses one could motivate from these Islamic perspectives or to mention some contemporary work on Islam and science such as that of Rani Dajani or Nidhal Guessoum. It would also have been pertinent to mention that just about a century after the death of Maimonides the Muslim scholar Ibn Khaldun produced works in natural philosophy that dealt with evolution in a sophisticated manner. Many see him as having anticipated aspects of Darwin's theory of evolution (Malik, Ziermann, and Diogo, 2018). Another relevant comparison with the Islamic context concerns creationism, which, like the creationism of Ken Ham, seems to be a largely modern phenomenon. A relevant parallel to Ham is provided by the Muslim creationist Adnan Oktar (Harun Yahya), author of "the Atlas of Creation". Making comparison with

other religions, like Islam, would strengthen the ability of this Cambridge Element to tell us something about evolution and *religion*, not only Christianity, thus addressing the need for the literature on science-and-religion to expand its horizon.

The final chapter of the book deals with the challenge evolution poses by explaining religion. De Smedt and De Cruz here deal with so called "evolutionary debunking arguments" (EDAs), a style of argumentation which has been extensively discussed in metaethics and recently also in the philosophy of religion (see Van Eyghen, 2018, for an overview). The authors present a taxonomy, distinguishing arguments that appeal to the epistemological principles of *sensitivity*, *safety*, and *sinister genealogy* (see section 4.5). Sensitivity means believing in things that exist and abstaining from belief in things that do not exist, in other words, tracking reality. If one can show, using cognitive science, that theists would believe in God regardless of whether God exists, then an insensitivity-argument against religion is at hand (pp. 57-58). By contrast, safety, De Smedt and De Cruz state, involves forming beliefs that are "safe from error" in the sense that they could not easily have been different. EDAs from lack of safety challenge religious beliefs by indicating that if our evolutionary history had been different, we would have produced different or no religious beliefs (pp.58-59). It is not clear, however, that the principle in this argument is that of safety in the way this term is commonly used in epistemology – something which should have been clarified. The central idea safety-theorists propose is not that if we could easily have had different beliefs, then our present beliefs do not amount to knowledge. It is that if we could easily have been wrong whilst believing what we believe – because the world easily could have been different – then our present beliefs do not amount to knowledge. Or more formally, S's belief that p is safe if and only if in most close possible worlds in which S believes that p, p is true (Prichard, 2010, 734).

The unsafety-EDA De Smedt and De Cruz discuss seems related to what Alvin Plantinga calls the "argument from historical conditionedness" (Plantinga, 2000, 427-429). This argument contains a principle which states that if S's belief that p is such that in a close possible world S would not have believed that p, then S's belief that p is unjustified. Plantinga rejects this on the charge of self-defeat: in a close possible world we do not believe in this principle (Ibid., p.428). Given how the unsafety-EDA De Smedt and De Cruz present resembles this argument and departs from how unsafety is commonly understood, some mention of this would have been in order. Furthermore, it would have been interesting to see concrete examples of arguments from the literature which fit the EDA template the authors outline. Interestingly, given the more common view of safety, a simpler theist response than the one the

authors discuss is at hand: if God exists, then S could not easily have been wrong in believing God exists, since it could then not easily have been true that God does not exist! This differs from the more complex guided evolution response to which the authors refer, but both provide important possible responses for the theist who is challenged by an EDA.

4. Conclusion.

This book provides a fascinating, concise, and empirically up-to-date introduction to evolution and religion. One of the best features of the work is that even though it is short (75 pages), it covers a broad range of historical and contemporary topics, both in science and in religion, without being superficial. It relates Christian philosophical theses to some of the latest evidence on human evolution, a field where recent years have seen some impressive advances and findings (including a new species in our genus, the Homo Naledi). But one shortcoming of this work is that the focus on the religion side is predominantly Christian, and there is currently in the science and religion literature a need for more coverage of how science relates to other religions. But, given that the authors take some steps in that direction by discussing Judaism and Hinduism, the work makes some progress towards addressing this need. In conclusion, read this and be inspired to find out more about the current, complex relationship between evolution and religion.

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Robert N. McCauley and George Graham, *Hearing Voices and Other Matters of the Mind: What Mental Abnormalities Can Teach Us about Religions*, Oxford: Oxford University Press (2020) 256 pp.; ISBN: 9780190091149 (Hbk), $34.95.

In *Hearing Voices and Other Matters of the Mind*, Robert McCauley and George Graham employ ideas from the cognitive science of religion (CSR) to explore the relationship between religion and psychopathology. They note that striking resemblances exist between features of mental disorders and features of religious thought and action, and that religions may possess resources for the domesticating of what might otherwise be deemed pathological behaviour. CSR is brought to bear on these issues based on the premise that a continuum exists between normal human behaviour and the extraordinary behaviours often associated with religious experience and mental illness.

That is, the same cognitive processes underlying everyday behaviour also underlie religious experience and mental illness.

In chapter one, McCauley and Graham lay out three concepts that will guide their investigation:

1. Ecumenical naturalism – naturalistic phenomena underlie both ordinary and extraordinary behaviour.
2. Explanatory pluralism – no single scientific discipline enjoys explanatory pre-eminence.
3. Philosophical naturalism – the accomplishments of science are unsurpassed in explaining the world.

On this last point, McCauley and Graham do not wish to be stereotyped as advocates of scientism. They believe philosophy, religious studies, and the humanities in general still play a role in understanding the phenomena of religion and mental illness. It was not, however, clear to me in reading the book what that role would be. The book is steeped in a naturalistic worldview.

To their credit, McCauley and Graham view their work as a much-needed corrective to an overemphasis on a brain science approach to mental illness. They note that cultural differences are important in the experience of mental illness, and that religion is an important part of culture. Still, by focusing so completely on "sub-personal cognitive processes" in their analysis, it is not clear what role cultural differences actually play. If talking to dead relatives would be deemed pathological in the West but perfectly normal in an indigenous culture, what would a cognitive analysis add to our understanding? The book, while tipping its hat to the importance of other levels of analysis beyond the cognitive, never really demonstrates what those other levels might bring to the table or how they might interact with the cognitive level of analysis.

Following these preliminaries, chapters two through five examine specific types of psychopathology and their relation to aspects of religious experience. In chapter two, McCauley and Graham consider the religious experience of hearing God's voice and the auditory hallucinations common in certain forms of mental illness. Those who experience auditory hallucinations are not, we are told, actually hearing other voices. Rather, they are experiencing their own verbal thoughts as though they were the speech acts of other people. These hallucinations result from the malfunction of three cognitive systems:

1. Source monitoring – the ability to distinguish between one's own voice and that of others.

2. Agency detection – the ability to detect intentional, purpose-driven agents.
3. Theory of mind – the ability to understand the mental states of others.

Hearing voices, of course, is not a feature only of what we deem mental illness. Religious experience may also involve claims of hearing the voice of God – that is, experiencing one's own inner voice as the voice of God. McCauley and Graham do not ignore the difference between these two experiences. Mentally ill people often are quite disturbed by their voices while religious people usually experience hearing the voice of God as profoundly comforting. Nevertheless, McCauley and Graham want to argue that the auditory hallucinations of the mentally ill and hearing the voice of God are not different at a sub-personal level of cognitive processing, an idea that can better help us understand both normal and abnormal forms of religiosity. But who decides what forms of religiosity are normal and abnormal? And what can we actually learn? This is not made clear.

Chapter three takes up the relationship between major depression and the religious experience of feeling abandoned by God. A large part of the chapter revolves around a detailed analysis of Mother Teresa's famous account of feeling abandoned by God and having no sense of God's presence throughout her career of caring for those living in abject poverty. Given the duration and reported severity of her symptoms, McCauley and Graham believe Mother Teresa had a mental illness – a specifically religious type of depressive illness. In fact it might be said that there is a spiritual component to all forms of depression, caused by failure of the agency detection cognitive system – in this case a divine agency detector. But perhaps Mother Teresa's experience was a natural human response to living with people in the midst of abject poverty and unspeakable suffering. It is not clear what a CSR approach adds to our understanding of her experience.

In chapter four, attention turns to the phenomenon of religious scrupulosity and its similarity to Obsessive-Compulsive Disorder (OCD). McCauley and Graham analyze the experiences of John Bunyan and Martin Luther as characteristic examples of extreme religious scrupulosity marked by excessively conscientious adherence to religious teaching and ritual that fails to bring a sense of peace or satisfaction. OCD works in much the same way, as the sufferer is unable to find satisfaction in the repeated exercise of an illogical ritual such as excessive hand-washing or checking to see that the stove is turned off. This results cognitively from the breakdown of an evolved security system – the ability to feel satisfied that potential threats in our environment are controlled.

Because ritual plays a significant role in many religions, McCauley and Graham see religions as particularly enticing arenas for the expression of OCD

(like the Orthodox Jewish hand-washing ritual), and conclude that religious scrupulosity is indeed a form of OCD. They do, however, concede that distinguishing between religious ritual compulsions that result from a mental disorder and those that result from culturally instilled, heartfelt convictions can be difficult. If so, what do we really learn about religious ritual and OCD from the attempt to link the two?

In chapter five McCauley and Graham explain the by-product theory of religion. According to by-product theory, "…substantial swaths of religious thought and behaviour are grounded in humans' maturationally natural cognitive capacities…that are critical to individuals' survival and that have nothing to do with religion" (157). Religion is therefore a culturally conditioned by-product that grows out of these underlying cognitive survival mechanisms. There is an exception, however – Autism Spectrum Disorder (ASD). Individuals with ASD have a deficiency in theory of mind cognitive ability. They have difficulty understanding that other agents exist that possess intentions and motivations. As a result, they cannot comprehend the idea of God as an omnipotent agent and can connect to religion at only a superficial level, if at all. Rather than having cognitive links to religious behaviour, as is the case with OCD, hearing voices, and depressive disorders, ASD undermines the development of religious behaviour.

In a final chapter, McCauley and Graham return to the principle of ecumenical naturalism (EN). They reinforce their point that EN's intent is not to "epistemically debunk or delegitimate religion or to attack its evidential basis" (214). EN is designed, rather, to "identify and describe mental systems and cognitive processes (motivational and otherwise) that undergird cognitive pathologies and impairments, including their manifestation in religious contexts" (214). Further, EN aims to do this in a way free of any reference to anything supernatural, for EN assumes the ability of many features of religiosity to be explained without presumptions about supernatural forces. But that doesn't mean that EN asserts that such forces fail to exist. Try as they might, McCauley and Graham bend over backward to carve out a space for CSR that they say does not undermine theology and religious studies, but I doubt whether many theologians or humanities-based religion scholars will agree.

A problem arises when McCauley and Graham consider what EN might help us understand about the motives that drive people to religious terrorism. Of course, terrorism is not an objective label; whether a violent act constitutes terrorism depends on the perspective of the person labelling it. Nevertheless, McCauley and Graham write:

> "Suicide bombing can be an extreme version of such initiation rituals, where the benefits of membership and vigilance in favour of the group simply come

> in an afterlife. It can simultaneously serve as an extreme expression of such antagonism toward the group's foes" (221).

Do suicide bombers really act out of a sub-personal cognitive need for group solidarity? Or are they well aware that they act out of a sense of the profound frustration that attends those who are systematically denied justice and denied opportunities to struggle for justice in a non-violent manner? The latter seems more likely to me. And as a practical matter, addressing systems of injustice will be a much more effective way of reducing the level of "religious terrorism" than analyzing the supposed underlying cognitive motivations of violent actors.

Hearing Voices will be of great interest to those invested in the cognitive science of religion. Those not so interested may find it a problematic read on a number of levels.

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Wolfgang Smith, *Physics and Vertical Causation. The end of the Quantum World*, Brooklyn, NY: Angelico Press (2019), 150 pp.; ISBN: 9781621384298 (Hbk); $ 16.95.

This small book looks at first like a lightweight text concerning physics and the quantum world. But just moving the eyes down to the bottom of the cover to find the author's name we recognize that it will be more than this – a rich challenge inviting us into a profound synthesis of a life of scholarship by a very serious and competent professor.

A premise before embarking on the substance of this review, concerns what we can highlight as a special key to this engrossing book: the author's addressing our profound needs for Order, within a world characterized by increasing Disorder, despite the deterministic claims of Enlightenment thought. To do this Dr Smith introduces the ontological roots of his epistemological research.

Quantum theory, with its "Quantum Enigma", is the starting point for exploring the core question related to the "understanding of what physics *is*" – that is to say, the problematic relation between physics and reality [p. 2]. Surveying the evidence concerning the end of determinism in scientific epistemology, the author starts guiding us into the search for "bridges", first between wave and particle and ultimately between physics and reality themselves.

This is possible simply considering the "given" and subsequently "discovered" quantum theory, which appears to be surprisingly not "man-made", and therefore to offer the possibility to "look over the good Lord's shoulder while He is at work" [p. 5].

A new logic is needed in the quantum world which could be considered a call for new horizons to be explored in our understanding, not only from the intellectual point of view but even more in the ontological perspective.

This issue is prepared by the initial tenet of the Neils Bohr's Copenhagen interpretation which affirms that a "quantum system does not own its dynamic attributes" [p. 8]. For the very first time physics seems not to own itself, opening the way to the possibility of dealing with a physics not "stand alone" anymore [p. 18] because of its claim to a different conception of reality. In fact: "if we define an ordinary object as one that owns its dynamic attributes…*there are no ordinary objects* in the quantum realm"! [p. 9]. In this unexpected picture it appears also that "there are no local objects: in a word, reality is non-local" [p. 11]. This result was unacceptable for Einsteinians because non-local behaviour (instantaneous interaction over a distance) is incompatible with Relativity Theory.

At this point a new key is necessary to explain reality and we have to go back to the beginning, searching for a misleading problem that has occurred somewhere and affected the very crux of scientific method.

Dr Smith traces the initial issue in two directions: the first is philosophical and the second is truly scientific.

Pursuing the former, he cites the *Cartesian bifurcation* which forced reality to be divided into *res extensa* (external world) and *res cogitans* (subjective realm), which are mutually exclusive. This was a "bad philosophy", he says with Heisenberg, that influenced the whole of physics until the emergence of quantum theory, which spoiled this system!

The Quantum Enigma can be solved by extending, not reality, but our epistemological approach on a new ontological basis, to discover the "bridge" which is needed if we are to perceive not an *image* of reality (*res cogitantes*) but the external objects themselves. The "hidden key" is therefore proposed as being an *ontological distinction* between *corporeal* and *physical* objects, where the former correspond to sense perception (direct perception, with *qualitative* attributes) and the latter are connected to the "*modus operandi* of physics" (measurements and discoveries, empirical means, *quantitative* attributes).

With the Cartesian bifurcation there was, and according to the author is still, a misleading distinction between the power of physics, which was elevated to the rank of true interpretation of reality (this is *res extensa*), and the

illusory image we can form of it by ourselves (this is *res cogitans*). From this derives the extraordinary power afforded to science and determinism, which really shaped the modern way of thinking, but which in turn has now been disproved within the quantum realm.

On this basis a different understanding of reality is now emerging, which considers corporeal and physical objects as ontological planes, not just epistemological ones! And the key is properly the "bridge" enabling us to pass from one plane to the other in both directions: the theoretical approach from corporeal to physics and the empirical one, from physical to corporeal objects.

As we can see the bridge is not horizontal (epistemological) anymore but surprisingly vertical (ontological). Corporeal objects do *exist*, in the very opposite worldview to that which instead affirms that physical objects exist "objectively" (Cartesian bifurcation), while they are now set in the *sub-corporeal* or *sub-existential* domain, as Heisemberg stated regarding the elementary particles that are ontologically: "in the middle between possibility and reality" [p. 19]!

Recovering the metaphysical foundation expressed by the *hyle* (or *materia*) plus *morphe* (or *form*) dichotomy, the *integral cosmos* is with us again (like before the Enlightenment) and is consequently depicted as a "hierarchy of horizontal planes", ontologically connected with vertical distinctions: from the upper we have the *corporeal* world, then the *physical* universe (where the quantum world is) and finally *materia prima* (or pure *materia*).

According to the author's analysis, the Cartesian reduction has deeply deprived the external world of the precious vertical ingredient (or *verticality*) where quantities derive "from below" and qualities stem "from above", the latter being no longer confined to the subjective realm of *res cogitantes* [p. 24]. The *loss of the sacred*, and the loss of our bearings which led us to "become progressively dehumanized", are the heaviest consequences of the misleading Cartesian distortion that involved four centuries of science!

In this way "values" are finally rescued from subjective imaginary (caused by the Enlightenment-based reification of the quantum world at the expense of the corporeal one, and with the subsequent disappearance of the concept of substance) to be again restored with their foundation upon *truth*.

In this context the central item is, then, what Dr. Smith calls "*vertical causation*", as a supra-physical mode of causation acting instantaneously, above time [p. 26], which deconstructs the undeserved and erroneous authority and tyranny of the horizontal one. Vertical causation can therefore act across ontological planes and hence between corporeal and physical objects, while this is impossible for horizontal causation. The "act of measurement" is an

example of this passage, "inasmuch as it interrupts – or overrides – the Schrödinger causality indigenous to the physical plane" [p. 27], and entails an ontological transition emanating from the corporeal side, instantaneously in time and encompassing all space, no matter the spatial separation. Moreover the act of measurement "does indeed entail a transition from the *physical* to the *corporeal* plane…as the connecting link between the quantum world of *potentiae* and the *real* or *existent* world of corporeal entities" [p. 83].

Two foundations for a new contemporary science are now finally disclosed: an *ontological* discernment over different planes (corporeal and physical) and an *aetiological* distinction concerning horizontal and vertical causation.

The act of being, as "the most intimate element of anything", bestows not only being itself (existence by way of substantial form) but also the "power to act with an efficacy of its own" [p. 33], and this happens by way of vertical causation in all creatures.

The first important example then proposed for humans is *free will* as the capacity, in addition to the "active" power, to act from within (vertical causation). This is a real "cognitive" power, according to the presence of the *anima rationale*, which demands *supra-temporal* acts as an "access" to the *nunc stans*. Immediately connected there is the verticality of *visual perception* in which the soul accomplishes the achievement of "putting together", and finally the third point is the *verticality of intellect*, able to "see the point", again surpassing horizontal causation.

The very surprise is then, after these ontological hinges, the scientific way presented by Dr. Smith to re-evaluate the problem and the solution to the Cartesian bifurcation, suggesting primarily the research of James Gibson, who "*falsifies* the Cartesian premise *on scientific grounds*" with his "ecological theory of visual perception" [p. 15.38]. He proposes that our perception is more powerful than the "Cartesian" one, in which we perceive just an image, or a phantasm. We have now instead an "ambient" light on a corporeal or "ecological" environment, characterized in quantitative *plus* qualitative terms, so that we perceive also the invariants, or the very *forms*, that are the *external reality (world) itself* – in other terms the corporeal and not the physical one! Perception therefore involves not only retina and neurons – that would be just a physicalist approach – but "more than the sum of parts", that means the intervention of the soul on the ontological plane, able to act outside the bounds of space and transcending the temporal ones. The second valuable contribution is provided by William Dembski, with his theorem stating that "no physical process, be it deterministic, random or stochastic, can produce *Complex Specified Information*" [p. 35], pointing in this way toward the evidence of vertical causation. With Alan Turing and Kurt Gödel, at last we then discover the *non-algorithmic* nature of what was considered the

"seeing" process, now redefined by Dr. Smith from the idea of a "process" to a "vertical and therefore *instantaneous* act" [p. 43].

Moving with increasing interest and involvement through the following pages of this extraordinary "small" book, we are now faced with the intriguing issue of "design", effectively (according to the previous results) showing a vertical causality "which does not emanate from substantial form, but can in fact *give rise to* substantial form" [p. 47].

To do this Dr. Smith first analyzes Einstein's Principle of Relativity in order to show that "there is…no complete – let alone compelling – argument to justify the shift from classical to relativistic physics" [p. 55], and adding that in classical physics it is possible to define a state of absolute rest in which one frame can be singled out as a reference! If this is the case, the idea of a "design" is possible, even if it must be well understood.

He criticizes Einstein's famous 1905 conclusions according to the postulated "proof" of the absence of any absolute rest subsequent to the failure of the Michelson-Morley experiment, and affirms instead that there are no reasons to justify the necessity of invariance among different groups (Galilean and Lorentzian], for mechanical and electromagnetic phenomena, and therefore no necessity of relativistic changes! In fact, in our author's conclusions, classical physics (mechanics and electromagnetism), being valid in different frame systems, still proves a Principle of Immobility of one with respect to the others (this is the possibility of an absolute rest), with no need of the Relativity Principle.

The problem is basically to allow or not allow science to consider the possibility of a *design*, and subsequently its existence or not, inasmuch as "the existence of *immobile* reference frames…constitutes an instance of *design*!" [p. 57].

After this first result the author, following a logical thought-process, comes to a more surprising though immediately connected conclusion: according to Mach's Principle, together with the Immobility Principle in the context of Newtonian physics, he affirms *geocentrism* as being definitively reasonable. In this connection he refers also to the results of L. Popov, in his article describing the calculation of "planetary orbits by means of Newtonian physics, based on a *geocentric* reference frame" [p. 59]! In other words, the choice of geocentric coordinates as the stationary center of the universe is legitimate, against the Einsteinian idea (asserted to be not scientific but ideological) that an immobile reference frame cannot exist.

Dr. Smith adds another hint to this conclusion, speaking about the presence of an "axis" in the image of Cosmic Microwave Background coinciding with the ecliptic plane of the Solar System, which he interprets as the possibility

of not completely homogenous conditions in a large scale universe (which in turns implies the collapse of Einsteinian field equations!).

Pay attention, dear reader, being at this point like me understandably amazed, not to relegate these issues to a nostalgic and unscientific fantasy, inasmuch as the book really helps one to think, to open one's mind and to evaluate with intelligence and reason before and beyond the specific individual conclusions.

It is now evident that, after the demise of determinism, "quantum physics demands *two* supra-physical conceptions: one *aetiological* (vertical causation) and the other *ontological*" [p. 78], we therefore need "more-than-physical knowledge" [p. 85].

The "primacy of vertical causality" gives rise to horizontal causality (which acts in the corporeal domain), and depicts therefore an integral cosmos (macrocosm) ontologically tripartite, which can be represented with a circle where the circumference is the *corporeal* world (bounded by space and time), the center the *spiritual* one (with no bounds), and the interior the *intermediary* (bounded by time), with their counterparts in the human microcosm: *corpus*, *spiritus* and *anima*. This "simple" and ultimate conclusion seems to be just "iconic", but more than this, it delivers a final blow to Einsteinian theory, against the concept of "space-time".

This really seems to "close the circle"…for a book that is very inspiring and serious, really not easy to review! The rest is in the hands of the reader, to evaluate and first of all to *think*!

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Editorial note
Without either endorsing or rejecting Wolfgang Smith's views, Neil Spurway calls the attention, of readers wishing to learn more about this writer's thought, to a podcast by the Physics Foundation, available on *YouTube* in which Smith was interviewed on Jan 9, 2020; and to the website *Philos-Sophia.com*, which is devoted entirely to his teachings.

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Brian Cantwell Smith, *The promise of Artificial Intelligence: Reckoning and Judgement*, Cambridge, MA, London, UK: MIT Press, 2019; pp. 157; ISBN 9780262043045 (Hdbk.).

At first sight, a dry-looking study on artificial intelligence (AI) and its capacity to come closer to human intelligence, or "general intelligence" (AGI), might appear to be rather a long way from our Bulletin's focus, and from the interest of those trying to make sense of scientific developments for theology. After all, the advances in AI would have a remote impact in the way we try to better understand Christian revelation, or religious beliefs more broadly. This is just a first impression. Theological engagement with science – and its repercussions in scientific awareness – can be conceived in many ways. From my own experience, true advance in science rarely remains irrelevant for theology, when understood as a far-reaching enquiry into the last consequences, for human meaning and hope, of every advance.

In my opinion, this is a fundamental book for theologians trying to make sense of developments in AI, their achievements and limits; and still more, this is a deep reflection on the contrast between humans and computers, and hence about the human condition, a duty reading for those who engage in theological anthropology, with a derivate impact on how we conceive religious faith as a way to engage with reality. Since the book is brief, it can be read in a short time, even if it requires slow digestion, especially in its last chapters.

Cantwell Smith is a leading and experienced philosopher specialized in computing and cognitive science; hardly could we find somebody fitter for this task. As an anecdote, he tells us that his father was a theologian. Several traces of this genealogy can be perceived in the book's last chapters. His aim is stated from the inception: to provide an analysis of the past and recent achievements of AI and check out to what extent they come close to human or general intelligence. The answer is clearly negative: not only we do not get closer, but we do not have a hint about how to proceed to come nearer to that goal. However, the author provides at the end of his book a guide that could turn out useful when trying to design that kind of intelligence, or to look for the nearest version.

The book is divided into 13 chapters with very short titles, however its structure is quite simple: more than half of its brief content is devoted to describe what has been the first wave of AI, with its program and expectations, and the second wave, designed as 'machine learning', and continuing till the present time, again describing its renewed aims and approaches. Then come several chapters of assessment, aimed to test to what extent the promise of AI is accomplished or to what extent its achievements can overlap those of the human mind. The analysis becomes fine-grained when dealing with the limits

of artificial or synthetic systems and the particular characteristics of the human way to engage in the world. The author presents both descriptions in a very systematic and succinct way, almost didactic, which helps to enhance insight and clarity.

If the argument can be synthetized, the key point is clearly related to the tension between representation and reality. To assume the real, to relate to it in a deferential way, and not just to play with its representations, constitutes the substance of human thinking.

Throughout the book, Cantwell Smith shows the contrast between how intelligence has been conceived to adapt to computing systems, and the real thing. He designs as GOFAI (Good old-fashioned AI) the first wave and its program, which reduced thought to rational inference, and conceived the world as formal and discrete units, easy to represent and manage. That program could lead to some advances in computation and functions like text recognition. However, it became clear that such a model would not go much further; critical points are raised in these pages, at the neurological, perceptual, epistemological and ontological levels. Indeed, our concepts appear at many times quite vague and reflect a world without clear cut contours (35). We register the world in a practical way, as common sense, quite different to the way machines do. At the end of p. 38, while delineating the difference between human intelligence and mechanical systems, the author states "It [intelligence] did not work that way", a sentence that calls to mind another book published by the same Press almost 20 years earlier by Jerry Fodor: *The mind doesn't work that way*.

The second wave took place later connecting with the efforts of cognitive neuroscience. At that point an alternative program emerged, the 4e program claiming the embodied, embedded, enactive, and extended character of human cognition. The new modality of AI took in some sense a bypass to avoid those issues, focusing less on the former model, and trying a different approach. The book describes the new wave in terms of a statistical endeavour, based on correlations, applied to massive amounts of information looking for weak inference; learning; big data; and computational power. The success of this model was clear in fields like facial and other forms of image recognition.

Subsequent chapters – from Ch. 6 on – provide an assessment of the most recent version of AI. The criteria are similar to those applied for the first wave, but the diagnosis of failure assumes another tone: the new systems come closer to the mark, but not close enough, because the 'world' these systems try to represent and categorize in discrete units and through algorithms is far from the world we live in, with its complexity. The epistemological challenges appear to be the hardest, and the analysis undertaken

invites us to focus on the different knowing styles of humans and machines. Indeed machines "do not know what they are talking about" (76). We need to be aware of the difference between the world and the representation we apply, something a machine cannot do. We need orientation; to be able to distinguish appearance from reality; defer from the world; legibility; to distinguish between actuality, possibility and impossibility; commitment to the world; and a sense of the self. A machine would learn in the full sense only if it could "register the world in terms of objects" (95)

Cantwell Smith is very committed to a realistic view of the world as world, accountable and very far from postmodern vagaries. He nevertheless admits to pluralism – to some extent. The last chapters offer conclusive reflections following again the book's subtitle: the contrast between reckoning, proper to machines, and judgement, a human trait. Judgement requires an existential and deferential engagement with the world. A sapiential tone appears in these pages: "Judgement is something like *phronesis*, that is involving wisdom, prudence, and even virtue" (111) – ideas that range far from machines. In an enigmatic tone the author refers in these closing pages to the world as "the One", something bigger than or transcending what we can represent; he then argues for responsibility and justice. Consciousness and emotion play their parts too, together with a holistic sense, revealing a world to which we need to be devoted, beyond any short-sighted subjectivity, something beyond "science as currently conceived", and requiring rather good education and even friendship (133). The last pages assume a near-mystical mood, talking about the "One" and the "ground of being" (143, 144) to vindicate insistently that commitment to the world. Soon after this, the author talks about a judgment that requires "passion, dispassion and compassion – that ultimately underwrites what matters, not just about the human, but about the sacred, the beautiful, and the humane" (146); and finally, he writes: "We should stand in awe of the capacity of the human mind" (147).

For every reader, it must be quite surprising that a book devoted to AI and its closeness to human intelligence, written mostly in an analytic and dry style, could finish with the expressions just quoted, applying an almost theological register. I find that move quite revealing, and in line with other recent proposals trying to make sense of human beings and their specific traits. This is not just about the disputed issue of 'human uniqueness', which is here wisely addressed simply in terms of the contrast with machines, but still more a reflection on human identity, meaning and its relationship with the world we inhabit. I find very inspiring that a philosopher of the authority of Cantwell Smith might draw our attention towards aspects of human mind, knowledge and engagement with reality that, in the limit, clearly point to a transcending dynamic, a sensitivity able to move beyond scientific reductionism and the

shortcomings of postmodern philosophies, both of them unable to deal with the world as it is, in its revealing and intense texture.

In the end, what I perceive in the analysis offered in this book is a kind of new transcendental argument – one more among many – pointing to how the conditions for the possibility of true knowledge demand a recognition of the weight of reality, and a deep faith about its high value and meaning. Indeed, what is at stake is the possibility to project meaning in life in its unavoidable engagement with reality, beyond the modern illusion of pure subjectivity. Probably conceiving such meaning renders us human, and it usually involves a transcending movement.

Nobody knows how AI will evolve in the coming years and what achievements it will reach, but for now nothing in sight suggests that it is moving in the same direction as that which drives human minds. A different issue is whether mechanical intelligent systems need to approach the human ones to accomplish the tasks they are designed for. Probably not, and becoming aware of that difference we will be able to better appreciate what is to be human, and its greatness.

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Neil Messer, *Science in Theology: Encounters Between Science and the Christian Tradition*, London: T&T Clark (2020), pp. 208; ISBN: 9780567689818; £ 16.99 (Ppbk.)

For those working in the field of science-and-theology it is quite obvious that such a relationship, or the interface we try to inhabit, is – from its inception – very complex, and becoming still more complex as we try to advance and to better explore the ground. Such complexity is revealed in several ways: science and religion or theology are both quite plural practices with many distinct versions or styles and outcomes. We do not proceed from a static and well-integrated body of knowledge relating to a stable tradition trying to make sense of ancestral revelations. We deal with very dynamic and changing insights, subjected to the vagaries of time, context and new developments. Furthermore, the complexity stems from the diversity of models or styles when trying to establish a fruitful relationship, or at least when we try to observe one side from the other of that divide and try to learn from our alternative world views. Finally, levels of engagement change from one

specialist to another, who needs to decide to what extent we can assume the inputs from the other side.

Since it seems that theology can hardly ignore the tremendous knowledge that contemporary science has acquired and needs at least to pose questions about its meaning for theological research, we need absolutely to impose some order and try to better classify different positions and entries into that disputed interface. To some extent, we need some chart or map to navigate an increasingly plural and diversified territory. Indeed, things become still more complex after we take note of new entries in the last few years claiming distinct positions and enriching the available possible versions or styles that such a dialogue can assume.

All this renders the book offered by Neil Messer very timely and relevant. He holds a PhD in molecular biology and is a theology professor focusing most on bioethical issues. The book is important for several reasons. The first is that it provides a good guide for theologians who need to decide the range and reach of their engagement with science, a decision not without its risks and long-term consequences. The second reason is that the book updates the current state of research and incorporates very fresh entries, moving on from previous typologies established in different contexts and at earlier stages of the ongoing dialogue. Then, the practical cases analysed provide informed applications integrating recent developments.

The author states from the beginning that his book tries mainly to specify which place science can have in theology, or, in other words, to what extent theologians should engage with scientific views and data. The question, therefore, is not about "science and theology" but about how science can be received and integrated into theological research and its own discourse. The answer to this question is – as might be expected – plural: five models or types are proposed. The reviewer cannot avoid, in this situation, reference to a series of theological typologies that stem from the beautiful classical work of Richard Niebuhr in *Christ and Culture* (1951) with his five possible types to conceive the tensions between Christian faith and cultural or social context. Diverse theologians have followed suit, and in all cases typologies in five models have been built: A. Dulles, H. Frei, D. Tracy, and B. Bevans, all proposed their models in five types.

The typology proposed by Messer builds on a scale from greater to lesser engagement or maximal to minimal role that science plays in theological elaboration. The first level is of a complete scientific dominance, almost excluding any theological role, science just playing the role of supreme judge over everything, including religious faith and traditions. The second depicts science in a rather normative way, rendering theology something of a 'dependent variable'. In the third type, theology plays a greater role and engages

in a dialogue of equality with science. In the fourth, theology develops a more critical stance towards science, to vindicate its own voice; and in the fifth, theology becomes an autonomous discourse completely besides or above science. As might be expected, Messer advocates the third and fourth models as those most promising and useful for theological engagement and growth.

Interesting chapters are devoted to applying the suggested typology to three contemporary fields of hot discussion between science and theology: the issue of divine action in the midst of physical causality; the thorny topic of theodicy in the context of evolutionary explanations; and the recent question about the theological implications of the cognitive science of religion. In all these cases, the examples provided manage to fill the five types of possible theological reception. It is worth noting that Messer incorporates recent voices and analyses, like those of Sarah Lane Ritchie, who has vindicated the 'theological turn' to avoid the difficulties in trying to best describe divine action; or the work of Peter Harrison, and his acclaimed book *The Territories of Science and Religion*. In both cases we perceive attempts to balance a relationship formerly too much leaning towards science, and now able to better establish the theological role.

The study of the third case, the impact of the cognitive science of religion (CSR) displays the contrasting positions between those who apply those studies as a debunking strategy – a well-known story – and those like Justin Barrett who discover in such new approach to religion an opportunity to claim the value of religious faith and its contents.

The book offers some alternative ways of engagement, relying on poetry and other expressions. Prof. Christopher Southgate is a good example, as one who is engaged deeply in the fields of evolution and suffering. The author insists, at the end of his work, on the value of this new typology as a guide that allows theology students to engage better with science, and to find out connections and opportunities to develop their own programs or systematic work.

Messer's book is convincing and very clear, well written and even didactic; indeed, it becomes an excellent introduction for beginners to the practice of theological reception of scientific views or ideas. I think this can be considered a text or handbook for those curious about what role might science play in theological research. "Between very large and very small" is the answer, and even if the author clearly recommends the third and fourth approaches, or rather a combination of both, we cannot avoid the feeling that, in any case, other positions are perfectly legitimate and we need to take account of them for the time being.

I would add to my review some caveats aimed at improving theological views, and possible ways for a theologically curious mind to engage with science. Take, for instance, the third application scenario proposed in the

book: theological engagement with CSR. This is a special case because – in contrast with the former two – we deal directly with religion, i.e. a subject theologians have been studying for many centuries, and where they can show some expertise. The first caveat reminds us of an important theological function somewhat neglected in the book: a critical engagement with science. The issue is that theology needs to enter the fray that CSR is growing into in recent years, since theologians have a special authority on this topic, to discern what appear as good or insightful approaches, and what appear as deeply flawed, possibly because of their very reductive stance, or even because of the weak empirical evidence they can show. Theology has much more to say in such a case – and in several others where the scientific method is being applied, like in anthropology.

The second suggestion is more positive: the CSR and other similar programs of scientific study of religion provide interesting clues to better develop several theological topics, like the treaty of faith, and – again – Christian anthropology's central issues. It would be a pity if a general model prevented particular modes of engagement in which theology could learn very much to better describe or deepen its own territory. Messer does not exclude that possibility; however the insistence on the theological turn and the Peterson 'territories' thesis could imply that theology has very little to learn from the sciences. I would add that this principle extends to some social sciences, like sociology, organization theory, and management, which are now becoming unavoidable companions when we try to understand the secularization process or the role of churches in advanced societies.

The third caveat regards methodology, something we theologians could dismiss when dealing with science. A few theologians are learning to apply empirical methods in theological study, with very promising outcomes. Clearly this is a way in which science plays a direct role in theology, but one that becomes less evident when building the five typologies, since it is difficult to locate such an influence in the general framework those typologies usually offer.

In my opinion, there is more on 'science in theology' than Messer has exposed, but the book offers an excellent departing point for everybody who wants to explore this difficult and slippery territory.

Lluis Oviedo
Antonianum University, Rome

New books relevant for Science-and-Theology

All the titles in this section are available for review; interested colleagues please contact the Editor to request one or more books.

General issues

John P. Slattery (Ed.)
T&T Clark Handbook of Christian Theology and the Modern Sciences
T&T Clark 2020
This handbook surveys the many relationships between scientific studies of the world around us and Christian concepts of the Divine from the ancient Greeks to modern ecotheology. From Augustine to Hildegard of Bingen, Genesis to Frederick Douglass, and physics to sociology, this volume opens the intersections of Christian theology and science to new concepts, voices, and futures. The central goal of the handbook is to bring new perspectives to the foreground of Christian theological engagement with science, and to highlight the many engagements today that are not often identified as 'science-theology' discussions.

Henry M. Cowles
The Scientific Method: An Evolution of Thinking from Darwin to Dewey
Harvard University Press 2020
This book considers the surprising history of the scientific method – from an evolutionary account of thinking to a simple set of steps – and the rise of psychology in the nineteenth century. The idea of a single scientific method, shared across specialties and teachable to ten-year-olds, is just over a hundred years old. For centuries prior, science had meant a kind of knowledge, made from facts gathered through direct observation or deduced from first principles. But during the nineteenth century, science came to mean something else: a way of thinking. The Scientific Method tells the story of how this approach took hold in laboratories, the field, and eventually classrooms, where science was once taught as a natural process.

Rodney Holder
Ramified Natural Theology in Science and Religion: Moving Forward from Natural Theology
Routledge 2020
This book offers a rationale for a new 'ramified natural theology' that is in dialogue with both science and historical-critical study of the Bible. Traditionally, knowledge of God has been seen to come from two sources, nature and revelation. However, a rigid separation between these sources cannot be

maintained, since what purports to be revelation cannot be accepted without qualification: rational argument is needed to infer both the existence of God from nature and the particular truth claims of the Christian faith from the Bible. Hence the distinction between 'bare' and 'ramified' natural theology.

Cosmological issues

Jim Baggott
Quantum Reality: The Quest for the Real Meaning of Quantum Mechanics - a Game of Theories
Oxford University Press 2020
Quantum mechanics is an extraordinarily successful scientific theory. It is also completely mad. Although the theory quite obviously works, it leaves us chasing ghosts and phantoms; particles that are waves and waves that are particles; cats that are at once both alive and dead; and lots of seemingly spooky goings-on. But if we're prepared to be a little more specific about what we mean when we talk about 'reality' and a little more circumspect in the way we think a scientific theory might represent such a reality, then all the mystery goes away. This book shows that the choice we face is actually a philosophical one.

Leland Royce Harper
Multiverse Deism: Shifting Perspectives of God and the World
Lexington Books 2020
Given recent speculation in quantum physics, suggesting that our world is just one in a series of many, Royce Harper calls for a shift in our concept of the monotheistic God of Judeo-Christian tradition. He argues that those who wish to maintain that the Judeo-Christian God exists ought to revise how they define this God and what they expect of Him, so as to maintain consistency between modern theism and the growing body of scientific thought. While this revision entails several concessions by the theist, the overall result is a stronger and more coherent account of who God really is.

Life-Sciences issues

Matthew Nelson Hill
Embracing Evolution: How Understanding Science Can Strengthen Your Christian Life
IVP Academic 2020
In recent years there has been an explosion in scientific understanding of evolutionary theory and its implications for human nature. Yet many Christians still see evolution as at best irrelevant to their faith and at worst threatening to it. Is it possible that adopting an evolutionary view of human origins can actually *help* us cultivate a relationship with God and a holy life? In *Embracing Evolution*, Matthew Nelson Hill invites readers into a constructive conversation about why contemporary science matters for Christians. Bringing clarity to an often fraught conversation, he provides an accessible overview of evolutionary concepts and takes on common concerns about tensions with Christian theology.

Anthropological issues

Adam Hart
Unfit for Purpose: When Human Evolution Collides with the Modern World
Bloomsbury Sigma 2020
The book explores the mismatch between our fundamental biology and the modern world we have created. In each chapter, Adam Hart explores how many biological adaptations that evolved to help us survive and thrive in a very different world are now working against us. For example, humans are superbly adapted famine survivors. Obesity might be a disease in the modern world, but it's really just a troublesome side-effect of some effective evolutionary brilliance. And in today's society, one of the biggest killers is stress. What started out as a life-saving "fight or flight" response in the face of bear attack might now cause headaches, loss of sex drive, depression and heart problems as we panic about missing deadlines or making sense of our work-life balance.

Haidy Geismar, Hannah Knox, Scott A. Midson (eds)
Love, Technology and Theology
T&T Clark 2020
This volume explores love in the context of today's technologies. It is difficult to separate love from romanticist ideals of authenticity, intimacy and depth of relationship. These ideals resonate with theological models of love

that highlight the way God benevolently created the world and continues to love it. Technologies, which are designed in response to our desires, do not necessarily enjoy this romantic resonance, and yet they are now remodelling the world. Are technologies then antithetical to love? In this volume, leading theologians have brought together themes of theology, technology and love for the first time, exploring different areas where notions of love and technology are problematized.

New scientific study of religion

Luomanen, Petri, Rikard Roitto & Colleen Shantz (eds).
***Social and Cognitive Perspectives on the Sermon on the Mount*.**
Equinox Publishing 2020
Social and Cognitive Perspectives on the Sermon on the Mount offers fresh readings of themes and individual sayings in the Sermon on the Mount (SM) using socio-cognitive approaches. Because these approaches are invested in patterns of human cognition and social mechanisms, the resulting collection highlights the persistent appeal and persuasiveness of the SM: from innate moral drives, to the biology of emotion and risk-taking, to the formation and obliteration of in-group/out-group distinctions.

Vail III, Kenneth E. & Clay Routledge (eds.)
***The Science of Religion, Spirituality, and Existentialism*.**
Academic Press 2020
This book presents in-depth analysis of the core issues in existential psychology, their connections to religion and spirituality (e.g., religious concepts, beliefs, identities, and practices), and their diverse outcomes (e.g., psychological, social, cultural, and health). Leading scholars from around the world cover research exploring how fundamental existential issues are both cause and consequence of religion and spirituality, informed by research data spanning multiple levels of analysis, such as: evolution; cognition and neuroscience; emotion and motivation; personality and individual differences; social and cultural forces; physical and mental health; among many others.

Practical and Historical Issues

Giulia Isetti, E. Innerhofer, H. Pechlaner, M. de Rachewiltz (Eds.)
Religion in the Age of Digitalization: From New Media to Spiritual Machines
Routledge 2020
This book examines the current use of digital media in religious engagement and how new media can influence and alter faith and spirituality. As technologies are introduced and improved, they continue to raise pressing questions about the impact, both positive and negative, that they have on the lives of those that use them. The book also deals with some of the more futuristic and speculative topics related to transhumanism and digitalization.

Sana Loue
Case Studies in Society, Religion, and Bioethics
Springer 2020
This book explores, through case studies, the interplay between religion, culture, government, and politics in diverse societies on questions arising in the domain of bioethics. The case studies draw from multiple disciplinary perspectives, including history, theology, law, bioethics, public policy, science, and medicine. The text's global perspective permits a comparison of the differing approaches adopted by countries facing similar bioethical quandaries and the extent to which religion has or has not been instrumental in addressing such dilemmas.

Jeff Levin
Religion and Medicine: A History of the Encounter Between Humanity's Two Greatest Institutions
Oxford University Press 2020
Though the current political climate might lead one to suspect that religion and medicine make for uncomfortable bedfellows, the two institutions have a long history of alliance. From religious healers and religious hospitals to religiously informed bioethics and research studies on the impact of religious and spiritual beliefs on physical and mental well-being, religion and medicine have encountered one another from antiquity through the present day. In *Religion and Medicine*, Dr. Jeff Levin outlines this longstanding history and the multifaceted interconnections between these two institutions. The first book to cover the full breadth of this subject, it documents religion-medicine alliances across religious traditions, throughout the world, and over the course of history. Levin summarizes a wide range of material in the most comprehensive introduction to this emerging field of scholarship to date.

Announcement

Update on the ESSSAT Conference in Madrid, 2021

As we have already communicated in this bulletin, the ESSSAT Conference 2020 in Madrid on the subject "Creative Pluralism? Images and Models in Science and Religion" has been postponed to 2021. We still hope to hold that conference from 28 April to 1 May 2021. However, given the uncertainty surrounding travel restrictions and local conditions at the venue, the feasibility of holding the conference will be re-evaluated in January 2021. Until then, we strongly recommend that no travel bookings are made. We still hope the situation improves and we can see each other next year. We will keep you informed on how to register for the conference or how to confirm or renew your registration.

Legal Matters

In connection with the postponed conference and as president of ESSSAT I want to share with all ESSSAT members some legal matters that occur from the fact that we as a society cannot have our bi-annual General Assembly in 2020, as our bylaws require. This is especially important for those members of ESSSAT Council whose terms ended this spring, and thus for the legal status of the Council as a whole. ESSSAT is registered in Germany, so that German law applies. Germany has dealt with such issues in a special jurisdiction ("Gesetz zur Abmilderung der Folgen der COVID-19-Pandemie im Zivil-, Insolvenz- und Strafverfahrensrecht" from 27 March 2020 [Act to Mitigate the Consequences of the COVID-19 Pandemic under Civil, Insolvency and Criminal Procedure Law, an English version can be found here: https://www.bmjv.de/SharedDocs/Gesetzgebungsverfahren/Dokumente/Bgbl_Corona-Pandemie_EN.pdf]). In short, that law allows societies to postpone general assemblies and to extend the terms of all officers for one year.
On the basis of this regulation the Council of ESSSAT has agreed on the following:

1. The next General Assembly will be held during the Madrid conference on 1 May 2021. If that will not be possible, ESSSAT has the option to go for an online assembly in compliance with the German law.
2. The tenure of office of all members of the council will be extended to the next General Assembly on the basis of the German jurisdiction.

Both suggestions are in compliance with the German law so that ESSSAT will not endanger its status as a registered charitable society and will continue to have a functioning council.

I hope that all members consent to these decisions. However, I want to point to the fact that according to ESSSAT's bylaws, an extraordinary General Assembly must be held if more than a fifth of the members request this in written form to the president of ESSSAT. If anyone sees the need to have a General Assembly before Spring 2021, please send a message directly to me as president of ESSSAT (president@esssat.eu).

I extend my warmest greetings and best wishes and hope to meet you in 2021,

(Dirk Evers, President of ESSSAT)