UK Christian Church Leaders' Attitudes Toward Science and Religion

with Lydia Reid and David Wilkinson, "Building Enthusiasm and Overcoming Fear: Engaging with Christian Leaders in an Age of Science" and Zara Thokozani Kamwendo, "Resistance to Narratives of the COVID-19 Pandemic as an Act of God."

BUILDING ENTHUSIASM AND OVERCOMING FEAR: ENGAGING WITH CHRISTIAN LEADERS IN AN AGE OF SCIENCE

by Lydia Reid iD *and David Wilkinson*

Abstract. In popular culture, the relationship between science and religion has often been portrayed as one of "conflict." The impact of the conflict thesis can be observed in church leaders' hesitancy in talking about science and religion in the public domain, and it was this finding that inspired the project "Equipping Christian Leadership in an Age of Science." The data presented in this article (collected during 2015–2018) are derived from two separate pieces of research carried out in the United Kingdom. The first consisting of a survey of over 1,000 church leaders and interviews with 20 senior church leaders and, the second, with a strategic focus on ministerial training composed of 12 interviews with church educators. This article reflects on the findings from both pieces of research—covering topics such as church leaders' enthusiasm toward science, how church leaders view the relationship between science and religion and the role of compartmentalization in ministerial training.

Keywords: Ian Barbour; Christianity; Church of England; clergy; dialogue; ordination training; science

Introduction

One does not have to look too far to find examples of the "conflict thesis" (Wilkinson 2020; Lightman 2019) playing out in popular culture with examples being found in new atheist literature, comments made by comedians (Ricky Gervais and Stephen Fry) and TV programs/documentaries

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(Big Bang Theory and The Root of all Evil). The conflict thesis (the idea that science and religion are fundamentally opposed to each other) can easily be replicated in the media by constructing debates between scientists who are antireligious and preachers who are antievolution (Gundlach 2018, 163). Given the latter, it is not too surprising that when I asked church leaders the question: "would you be willing to talk about science-based issues in the public domain?," most of the nonscientist senior church leaders I interviewed responded in one of the following ways, they:

(a) declined the invitation,

(b) asked for further clarification on the issues being discussed, or

(c) delegated the task to a known "expert."

When probed further, their hesitation about taking part was directly linked to not wanting to appear uninformed or inadvertently participating in a media platform that has been purposely set up to convey conflict between science and religion. Both answers (a) and (c) are indicative of a perception of science that is both highly specialized and impenetrable to the lay person. Indeed, the Chief Executive of the British Science Association, Katherine Mathieson also alluded to this when she observed that "[S]cience needs to be taken out of its cultural ghetto… [I]t's seen as the realm of professionals and experts' (Mathieson 2017). Mathieson adds that this is more prevalent in science than other academic/societal spheres, such as business, arts, politics, or sports. It is also useful to make a distinction between perceptions of science as a discipline (which Mathieson is drawing on in her comments) versus science as represented in popular culture. Given this distinction, now let us consider how the relationship between science and religion is presented in the media and popular culture.

Despite the conflict thesis persisting in popular discourse, there are beginning to be small ripples of change, with people presenting a more nuanced account of science and religion in the media. For example, Brian Cox has recently spoken out about the limits of knowledge in science and his own personal agnosticism ("Atheism vs. God" in Russell Brand's Under the Skin podcast). In 2016, Cox attended a diocesan clergy day in Leeds where he spoke about the need for science to engage with other disciplines, such as: theology, philosophy, art, and music—in order to make sense of human "meaning." Cox also acknowledges the religious origins of science and is more receptive than, say, Richard Dawkins, in fostering constructive dialogue between science and religion (https://www.youtube.com/watch?v=9-eG-xDPXS8). Research conducted by Ecklund et al. also indicated that 47% of UK scientists view the relationship between science and religion as one of "independence" with 35% viewing the relationship as one of "conflict" (siding with science) (Ecklund et al. 2019, 65). In the media, Radio 4 has also recently commissioned a series called "The Secret

History of Science and Religion" in conjunction with the think-tank Theos. This series aims to address the myths around the history of science and religion (https://www.youtube.com/watch?v=Dg82jr583mI). It remains to be seen whether this more nuanced approach to science and religion gains traction in wider culture or whether it remains an underreported position in the media.

The observation referenced at the beginning of this article (about a perceived lack of confidence in talking about science among church leaders) emerged from the research carried out on the "Equipping Christian Leadership in an Age of Science" (ECLAS) project. The project is funded by the Templeton World Charity Foundation and headed by Canon Professor David Wilkinson and Professor Tom McLeish (Anglican lay reader and physicist). Its purpose, as highlighted in the project's title, has been to raise awareness of science-based issues in the church community and to facilitate and promote greater dialogue between academic scientists and church leaders. I will provide more detail on the project over the next few pages, however, for now, I want to focus on the purpose of this article which is to share findings from the two stages of ECLAS research.

The first stage consisted of a nationwide survey of over 1,000 UK church leaders and interviews with over 20 senior church leaders. The second stage, smaller in nature, included interviews with 12 church educators on the theme of AI and ministerial training. In both phases of the research, I found that although there is an enthusiasm and interest in science among church leaders and educators, this does not translate into confidence in talking about science in the public domain. Alongside the presentation of the aforementioned findings, there will also be a reflection in the conclusion provided by Wilkinson as he operates in the unique position of a "boundary pioneer," navigating the academic terrain of science and theology (Ecklund 2010, 46). In his account, he will encourage clergy, educators, and readers alike to reflect on what theological and scientific engagement might look like, as well as offering some practical next steps.

The Project: ECLAS

"ECLAS" was founded by Wilkinson and McLeish as a response to the perceived persistence of the conflict thesis in the public domain and the perception of church leaders as fearful or hesitant in talking about science and religion. During its preliminary year in 2014, the project's then researcher, Dr. Rebecca Bouveng, found that there was indeed a lack of confidence in talking about science among church leaders and, further still, that this lack of confidence extended beyond talking in the public domain, and into not wanting to be interviewed on science at all (an issue I shall return to later in the article) (Bouveng and Wilkinson 2016, 102). In 2015, Wilkinson and McLeish (in partnership with Church of England stake-

holders) secured further funding through the Templeton World Charity Foundation for a 3-year project aimed at facilitating the dialogue between science and Christianity. The project is unique in bringing together social scientists, natural scientists, theologians, and senior staff from the Church of England. Alongside the research into clergy attitudes to science, which I mentioned earlier, the ECLAS project also has a number of other foci:

- To provide theological training resources on science for ordinands.
- To fund "Scientists in Congregations" schemes (bringing together clergy and scientists from within the congregation to formulate events and research on science and religion).
- To host conferences on key scientific areas in conjunction with the academic scientists based at Durham University (covering topics such as cosmology, the environment, evolution, neuroscience, end of life, and artificial intelligence [AI]).
- To provide expert advice/support on complex issues (achieved through having a presence in the Mission and Public Affairs Division of the Archbishops' Council, Church House).

After completion of the ECLAS project in 2018, the team secured further funding for one year to scope research into AI, technology, and ministerial training. During this year, 12 interviews were carried out with church educators to assess their views on the inclusion of science (and, specifically AI) in ministerial training. The results of which are included in this article.

It should be noted that this article was written prior to the current global pandemic that began in 2019/2020 and has subsequently put science at the forefront of government policy and societal concerns. ECLAS and its team of researchers are currently adopting an interdisciplinary approach to studying Christianity and COVID-19—the results of which can be found in this issue with Dr Zara Thokozani Kamwendo's article 'Resistance to narratives of the covid-19 pandemic as an act of God'.

Existing Research on Science and Religion

Social scientific research into science and religion is an expanding area. In the United States, it remains a popular topic of exploration and it is also gaining momentum in the United Kingdom with a diversity of themes being addressed, such as: science and nonreligion (Lee 2019; Kind 2019), science and Islam (Unsworth 2019; Carlisle et al. 2019), public perceptions of science (Baker 2012; Pew Research Centre Survey 2014; Hill 2015), churchgoers' views on science (Evans 2011), university students' views on religion and science (Ingram and Nelson 2006; Hill 2011), academic scientists' views on religion (Ecklund, Sorrell and Park 2011; Ecklund et al. 2019), religious people's views on science (Ecklund and Scheitle 2018),

STEM career choices and religion (Scheitle and Ecklund 2017), and creationism and social networks (Hill 2014). In the United Kingdom, the Science and Religion Exploring the Spectrum (SRES) team is leading the way in this area. In 2014–2017, Professor Fern Elsdon-Baker and her interdisciplinary team conducted a major national survey into public attitudes toward science using samples from the United Kingdom and Canada. The project has since received further funding from the Templeton Religion Trust for an interdisciplinary global study on religious perceptions of evolution.

There has also been notable interest in views on evolution (using survey methods) with a number of polls being carried out in the United Kingdom over the last 10 years: BBC and Ipsos Mori ("The Origins of Human Life"—2006), UK Theos ("Faith and Darwin"—2008), International British Council ("Darwin Now"—2009), YouGov (carried out by Unsworth, 2014), SRES project and YouGov (2017). One of the key issues in carrying out research in science and religion has been the extent to which surveys inadvertently "force" particular positions; be it in the explicit wording or implicit assumptions behind the questions and corresponding answers. The starkest examples of this can be found in questions relating to the interpretation of Genesis, the age of the earth, evolution and, as shown by my research, the relationship between science and religion. While every care has been taken by the authors to avoid this tendency to "force" answers (by reading and learning from existing survey literature) inevitably, surveys are constrained by their structure.

Research specifically on church leaders and science, however, is scarcer and where such work has taken place, generally the sample sizes have been small. Of those studies, the themes of interest have generally been on the connection between personal faith and science (Bouveng and Wilkinson 2016), the relationship between science and religion (Gregory 2017), views on evolution and creationism (Colburn and Henriques 2006), and the implications of science and religion in education (Dickerson, Dawkins and Penick 2008). For the ECLAS research, there was a desire to upscale the sample size so that a "snapshot" could be provided on the way in which UK church leaders make sense of and understand science. Similarly to the themes mentioned above, the research was centered on how church leaders understand science and Christianity, their views on key science issues (evolution included), the extent to which science issues emerge (or not) in a church context, and suggestions on including science in ministerial training.

To date, there has been no research exploring the aforementioned issues using a large sample size and a combination of qualitative and quantitative methodologies. The closest study in terms of size was the Barna Survey commissioned in 2012 by BioLogos (a Christian advocacy group with a special interest in science and religion), which conducted 743 telephone

interviews with pastors from across the United States and from all Christian denominations. In their study, they found a diversity of views held in relation to human origins but categorized pastors into the following typology:

"Young earth creationism: core and leaning"

"Progressive creationism: core and leaning"

"Theistic evolution: core and leaning"

"Uncertain"

Of the 743 pastors surveyed, 54% were described as "young earth creationists" with 35% in the "leaning" category and 19% in the "core." As I pointed out earlier in the article, survey data on responses to evolution and creation are notoriously difficult to collect and subsequently analyze. Each survey has its own measures, as indicated by the Barna survey, and its inclusion of "core" and "leaning" responses. Making comparisons between data sets is difficult as there are no uniform measures, and other variables (such as sample size and Christian affiliation) can also affect the result. For example, in Dickerson et al.'s U.S. study of 63 Methodist ministers, they found that most of their participants accepted evolution and "only 20% of the 56 participants […] considered evolutionary theory to be 'lacking and unsatisfactory' and 'difficult to reconcile with faith in a creating God'" (Dickerson, Dawkins and Penick 2008, 371). The remaining participants viewed evolution as "God's hand at work" (loc. cit.). Interestingly, Dickerson et al. asked their participants to complete a geological timeline plotting the following events in order of occurrence: dinosaurs, formation of the Earth, people, birth of Jesus Christ, formation of the universe, first appearance of bacteria on Earth. The inclusion of the geological timeline was novel and it also highlighted the complexity of asking questions in this area as answers to both questions were not always consistent. For example, Dickerson et al. noted:

> …[W]ith the geologic timescale, we could not identify trends relating acceptance of scientific views and a particular relationship between science and religious faith. For example, of the 20% who did not accept evolution, only four held Religion Trumps Science views (e.g., "They agree but faith (Bible) is more reliable"), while the other seven held Independence (e.g., "Science describes 'what' and 'how', faith is concerned with 'why'") or Integration (e.g., "They relate and complement each other") views. (Dickerson, Dawkins and Penick 2008, 371)

The assumption in the extract above is that if someone does not accept evolution then they *ought* to fall into the "religion trumps science" group. However my research and the work of Elsdon-Baker (2015), and

Unsworth and Voas (2018), have shown that views in this area are not always consistent with a normative position. For example Harrold et al. found that in American society "science is a powerful source of authority […] and creationists, like most Americans, tend generally to accept scientific knowledge, unless it threatens their worldview" (Harrold, Eve and Taylor 2004, 72). Harold et al. point out that although creationism is often seen as an "anti-intellectual" movement, it is one that includes plenty of what he refers to as "knowledge workers": scientists, technicians, and engineers. These workers all want to prove *scientifically* that evolution is "pernicious" and "incorrect" (loc. cit.). Moreover, members of this movement will present scientific data to support creation putting them in the unusual position of wanting to reject mainstream scientific views on evolution, while also simultaneously using the "authenticating symbols" of science to support their creationist arguments (loc. cit.). Moreover, as Elsdon-Baker notes, denial of or uncertainty toward evolution cannot be "neatly packaged as scientific knowledge deficit" (Elsdon-Baker 2015, 425), nor does it necessarily mean that the respondent is anti-science.

One of the key threads running through the findings laid out above is the assumption on the part of the researcher that participants must hold (a) logically consistent views and (b) normative views but as Jonathan Hill reminds us:

> …those with academic positions…are incentivized to develop logically consistent worldviews and intellectual systems. Holding multiple, sometimes logically inconsistent, belief propositions is not a problem for most people. This isn't to say that no one ever attempts to make beliefs congruent; it is simply an acknowledgement that there is a level of messiness and incoherence in public opinion. (Hill 2015)

Similarly to Dickerson, Dawkins and Penick (2008), Colburn and Henriques' (2006) research on clergy acknowledged that the creationist community were not unified in their views and they also used a typological system to capture participant views on creation:

"Young earth creationism—literalist and progressive"

"Old earth creationism—literalist and progressive"

"Intelligent design"

(Colburn and Henriques 2006, 421–22)

Colburn and Henriques identified a lack of internal consistency about understanding the periods of time associated with "young earth creationism"; with some participants referring to a "day" as capturing thousands of years that is arguably more consistent with "old earth creationism" (Colburn and Henriques 2006, 421). Moreover, they also found that "old

earth creationism" came close to accepting a literal account of Genesis. Interestingly, unlike in Dickerson et al.'s research, Colburn and Henriques found that none of their participants selected the "religion trumps science" group.

Methodology

As Bouveng and Wilkinson found in their preliminary research, one of the major barriers of carrying out fieldwork with church leaders on science is their reluctance (particularly if they are from a nonscience background) to be interviewed or surveyed on the topic. Existing work on issues around recruitment in academic research have tended to focus on accessing "hidden" or "hard to reach" groups (Ellard-Grey et al. 2015; Rockliffe et al. 2018). In addition, Gilliat-Ray (2005) reflected on her experience of "frustrated access" when trying to recruit participants from an Islamic college. Both the research cited in this article and Gilliat-Ray's research can also be framed within the context of "insiders" and "outsiders" with researchers typically being the "outsider" to their target sample group. To a certain extent, this was also the case with my research on church leaders (given that I was not known to the participants or broader church community); but I would also argue that the wider context of how science and religion is perceived was also playing out here (see Reid 2019, 79 for an anecdotal example of this). In the case of the former (not being known to the sample group), I enlisted the help of "gatekeepers" to help establish "trust" between myself and the participants (Lewis-Beck, Bryman and Liao 2003, 3). This was particularly useful when recruiting Church of England bishops (who were the most difficult group to secure) often due to their busy schedules. However, after establishing the help of gatekeepers within the Mission and Public Affairs Division of the Archbishops' Council, I was then able to secure a further four interviews with Church of England bishops.

Having already highlighted some of the difficulties in recruiting participants for the research, there was a further layer of complexity in that those who *did* offer to be included in the research tended to exhibit one or more of the following characteristics:

(a) were from a "science background" themselves
(b) knew someone who was from a science background; or
(c) had a strong interest in science issues.

It is important to remember that the research participants were "self-selecting" and, as Bouveng and Wilkinson (2016, 101–2) rightly point out, skewed toward "a sample of leaders who themselves do not fear engagement with science." Similarly, Dickerson, Dawkins and Penick

(2008) found this phenomenon in their sample of 63 United Methodist Ministers with just under half having a degree or higher in science and with 94% rating their science knowledge as "good" or "very good." Dickerson et al. stated that the latter percentage was "troubling" since it may indicate an "overconfidence in their understandings" (Dickerson, Dawkins and Penick 2008, 368). Out of the 20 participants I interviewed, a quarter of them were from a "science background." This outcome was better than I had originally envisaged, however, I would argue that the remaining interviewees typically did have an interest in science (a variable harder to quantify than educational background).

The interview and survey participants included in the first phase of research were from a range of Christian denominations: Methodist, Baptist, United Reformed Church (URC), Pentecostal and Catholic clergy. However, due to the difficulty in recruiting participants, the sample was skewed primarily toward Anglicans. A breakdown of the participants for the survey and interviews from the first phase of research can be found in the second and third columns of Table 1.

Due to the specific composition of the target sample, research companies were unable to carry out the survey on our behalf, so this meant that the bulk of the survey had to be carried out by the ECLAS team. The survey was overseen by Dr. Tim Drye, the statistician to the project. Drye was aware of the methodological challenges facing the survey and was keen to reduce the likelihood of the sample being skewed toward clergy who were from a science background. To reduce the potential bias in sampling, most of the respondents (c900) were obtained through attending diocesan clergy days and asking a captive audience to fill in the survey over a lunch or coffee break. The clergy days were a useful "in" for the project as most of the events were largely uncorrelated with the subject matter of the survey. A breakdown of the diocesan days can be found in Table 2. In addition to attending clergy days, the online link was also sent out to other dioceses (such as Carlisle, Durham, Lichfield, and Huddersfield), however the response rates were much lower.

Table 3 also shows the approximate numbers of church leaders within each Christian denomination in the United Kingdom. Based on the first row—the ECLAS survey reached just over 10% of the total population of Church of England clergy. The numbers are much lower for the other Christian denominations and therefore it is worth keeping that in mind when reviewing the findings.

The main driver affecting whether or not I was able to obtain responses to the survey was gaining permission from the event organizers. At first this was relatively easy and the project used existing gatekeepers to facilitate introductions. However, after a few months, securing permission became much more difficult. In view of this, the project team decided to offer prospective respondents a chance to win a raffle prize of £2,000 (for

Table 1. Methodological considerations for the different phases of ECLAS research

Methodological considerations	Survey with UK clergy	Interviews with senior church leaders	Interviews with C of E church educators
Sample frame	Clergy from Christian churches in the United Kingdom. Paper questionnaires were filled in at diocesan clergy days across the United Kingdom.	Senior church leaders from Christian churches in the United Kingdom. Invitations sent out to Bishops, Cathedral Deans, and other senior leader equivalents. Broad geographical spread.	Church of England educators. Invitations sent out to theological principals, directors of ministry, diocesan trainers, strategic figures
Method	Most of the sample was collected using paper questionnaires and a small number online.	Face to face interviews, recorded and transcribed.	Face to face interviews, recorded and transcribed.
Analysis	SPSS base and tables modules	Thematic analysis and NVIVO	Thematic analysis and NVIVO
Denomination			
Baptist	49	3	0
Catholic	9	2	
Church of England	921	9	12
United Reformed Church	36	3	0
Methodist	46	2	0
Pentecostal	39	1	0
Total	1,100	20	12

Table 2. Breakdown of diocesan days and number of surveys completed

Christian denomination	Geographical location	Number of completed surveys
Church of England	Guildford	127
	Manchester	47
	Welwyn	47
	Flitwick	44
	Norwich	20
	Southwark	217
	Nottingham	88
	Worcester	33
	Ely	90
	Bradford	24
	Total	737
Methodists	Manchester	38
United Reformed Church	Scarborough	29
Church of Nazarene	Manchester	13
Ecumenical Event	Gillingham	24
Total		841

Table 3. Approximate number of Christian ministers/clergy in wider population

Christian denomination	Approximate number of clergy in wider population
Church of England[1]	7,700
Methodists[2]	3,459
URC[3]	426
Baptists[4]	2,987
Catholics[5]	4,634
Pentecostals[6]	4,762

[1] https://www.churchofengland.org/sites/default/files/2019-08/Ministry%20Statistics%202018%20FINAL%20report.pdf

[2] https://en.wikipedia.org/wiki/Methodist_Church_of_Great_Britain
[3] https://en.wikipedia.org/wiki/United_Reformed_Church
[4] https://www.brin.ac.uk/figures
[5] https://www.brin.ac.uk/figures
[6] https://www.brin.ac.uk/figures

a church of their choice) with the hope of incentivizing responses from clergy who are indifferent toward science. Interestingly, this resulted in both a higher uptake of survey completion and more variety in the quality and quantity of what was written.

Along with obtaining a broad range of clergy, the questions on the survey were also designed in such a way to reduce the impact of self-association with particular groups and/or viewpoints. A range of topics

on different scientific themes were presented and on *who* had raised the topic (e.g., friend, congregational member, or media). The aim of this was to reduce the risk of framing reflections driven by the respondent's own perspective and/or self-identification.

In the case of the second phase of research, all of the participants were from the Church of England (see fourth column of Table 1) and this was intentional due the Church's involvement with the Common Awards program that is used in ordination training. Unlike in the previous research where I openly recruited participants to talk about "science," in the second phase I advertised under the heading "ministerial training in a modern world." This was to avoid some of the difficulties I encountered when using the word "science," which seemed to put off a number of church leaders. As a result of omitting the word "science," I was able to recruit participants working in a theological education more easily. However, I still found a tendency toward having an interest in science among those I interviewed—a point I will expand on in the next few pages.

Research into Clergy Attitudes to Science: Findings

Enthusiasm, Interest, and Engagement

One of the key findings to emerge from the survey was that 91% of church leaders were having conversations about science with 61% of those having had these conversations over five times a year. Popular topics of discussion featured were: climate change, evolution, and origins of the universe. When asked what prompted the conversation, 30% cited "personal interest" and this trend was consistent across Christian denominations. Further evidence of personal interest was also observed in the finding that 85% of church leaders had researched, read, or watched a TV program on science in the last year. This means that most clergy are interested in science and are regularly consuming science resources albeit at a popular culture level. From the perspective of the ECLAS project, this is encouraging as it means that there is a potential appetite for providing further resourcing on science *beyond* those clergy who are themselves from a science background. As I pointed out earlier, enthusiasm toward science was also found in the Barna survey where 89% of clergy (regardless of their views on evolution) felt that addressing science issues in their local community was somewhat (51%) or very (21%) urgent (Bio Logos Barna Survey, 2012). Given the level of enthusiasm felt toward science among clergy, it is perhaps somewhat surprising that this did not translate into having confidence in talking about science in the public domain. For example, three of the senior church leaders I interviewed responded to the question "would you take part in a local radio interview on science and Christianity" with the following: "I'd

run a mile!" (Participant 19, C of E Bishop), "I'd clench buttocks!" (Participant 20, C of E Bishop) and "I'd say, why me?!" (Participant 15, Catholic Priest). When I probed these comments further, the points I raised at the beginning of this article were reiterated; that is, not being an expert in science and the feeling that media interviews tend to reinforce the "conflict" thesis.

In addition to personal interest as a key finding, another factor was the influence of scientists in clergy's immediate family or social circles. Of the 20 senior church leaders interviewed (minus the 5 that were from science backgrounds themselves), a further 5 reported having someone in their family who was a scientist. The survey responses also showed a statistically significant difference between those who reported themselves as having a close friend or family member who was a scientist and their likelihood of "disagreeing" or "strongly disagreeing" with the statement that "The money spent on sending a spacecraft to Comet 67P should have been spent on providing clean water for people throughout the world." The "strongly agree" and "agree" columns of Table 4 for the Comet 67P statement are mainly composed of those who do *not* have members of family or close friends who are scientists, while those at the other end who "strongly disagree" and "disagree" are more prevalent among those who do have scientists in their family/social networks. It is important to note, however, that there is still a sizeable chunk in the middle expressing hesitation about the comet statement regardless of whether or not they have family members or close friends who are from a science background.

Table 4. Crosstabulation on family/friend from science background and money spent on Comet 67P

		The money spent on sending a spacecraft to Comet 67P should have been spent on providing clean water for people throughout the world.					
		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Total
Do you have any family members or close friends who are from a science background?	Yes	7.1%	24.6%	35.8%	28.9%	3.5%	100.0%
	No	11.1%	27.9%	33.9%	24.7%	2.4%	100.0%
Total		8.5%	25.8%	35.1%	27.4%	3.2%	100.00%

Such a finding is in keeping with literature on science engagement with Archer et al. (2012) noting that "family habitus" influenced the extent to which science aspirations for teenagers became more "thinkable" (Archer et al. 2012, 884). Similarly, Scheitle and Ecklund (2017) found that a low level of science interest was the main indicator in religious parents not recommending STEM careers to their children. In addition, Hill's research exploring the persistence of anti-evolution stances over time among young people found that "social networks play an important moderating role" (Hill 2014, 575) and are more important than educational attainment. The influence of personal interest was also found to be an important factor in research conducted by Scheitle and Cornell (2015), who found that personal interest in a topic meant that congregation members were more likely to remember it being preached about by their relevant church leaders.

On the whole, my research suggests that clergy are indeed enthusiastic, interested, and engaged with science (albeit at a superficial level—in the form of books, documentaries, and so on). However, as I highlighted earlier, there is a seeming disconnect between levels of enthusiasm/interest in science and subsequent confidence or knowledge in talking about science in the public domain. This hesitation is bound to the points I referenced at the beginning of this article to do with a perceived sense of science as belonging to "experts" and the prevalence of the conflict thesis in media panels.

Relationship between Science and Christianity

Having already established the level of enthusiasm and interest clergy have toward science, the next connected theme to explore is the way in which clergy view the overarching relationship between science and Christianity. Similar to the discussion on evolution, asking this type of question on a survey is problematic since the way questions are framed impact on the answers selected. Hill raises this point in his discussion on data concerning whether Americans see science and religion in conflict. He found that in surveys such as the Pew Research Centre survey (2014) where participants were offered two answers to choose from (e.g., science and religion "generally agree" or "generally conflict"), then most select "generally conflict" (around 59%). However, when a *third* possible category is offered (e.g., "not related to each other in any meaningful way"), then only between one-quarter and one-third select the same "conflict" response (Hill 2015).

In view of this, the choice of answers I offered when asking how science and Christianity related to each other subsequently took the form of Ian Barbour's science and religion typology: "integration," "dialogue," "independence," and "conflict" (a more detailed discussion of Barbour's typology can be found here: Reid 2019, 88). I also included the

additional category of "other." In contrast to the findings of the Pew Research Centre survey[1] cited above, I found that 51% of the clergy I surveyed selected "integration," followed by "dialogue" (45%), "other" (4%), "independence" (0.4%), and "conflict" (0.2%). Based on these percentages, one may be tempted to make the assumption that science and religion are seen by UK clergy as being defined by "integration" or "dialogue" rather than that of overwhelming conflict. However, when I asked participants to expand on *why* they selected their answer, then, something rather more interesting began to happen. The original typology answers did not always match to the reason given for selecting that answer in the first place (for a more detailed discussion, see Reid 2019, 92). For example, although 0.2% of the sample selected "conflict," the word "conflict"—and softer synonyms—were used in the elaboration of how science and religion interact with each other. Although the Barbour typology offers a useful historical and theological analysis of science and religion, the findings of the research indicate that clergy views on science do not always neatly fit within any one category. Instead, clergy responses may cut across different categories depending on whether they are being asked to reflect on how they view science and religion in their own life vs how they see the relationship in an abstract way.

A more high-level sociological analysis of the conflict thesis can be found in the work of Evans and Evans (2008), who both make a distinction between the symbolism (e.g., ideas, beliefs, and/or discourses) and the social-institutional aspects of religion and science (e.g., the institutions that propagate ideas, beliefs, or discourses). They indicate how rarely science and religion conflict at all, as well as the tendency for existing literature to view religion with all its variation and to view science in more static or monolithic terms (Evans and Evans 2008, 91, 100). Evans and Evans' analysis offers an alternative to the work of Barbour and, arguably, their findings have the capacity to challenge how science and religion should be taught to ordinands in the future. Interestingly, in Ecklund and Scheitle's research with Christians in the United States, they found that 17% of their sample would consult a religious leader if they had a question about science—this increases to 34% among evangelical Christians. Recognizing, of course, that Ecklund and Scheitle's research is in a U.S. context, it still highlights the importance of clergy being suitably equipped to talk about science issues (Ecklund and Scheitle 2018[2], 45). Further discussion of the latter can be found by Wilkinson in the conclusion of this article.

Compartmentalization and Ministerial Training

Interestingly, in the previously mentioned Pew Research Centre survey (2014), 59% of Americans saw science and religion in conflict, yet, when asked whether science conflicts with *their own* religious beliefs this reduced

to 30% (Funk and Alper 2015). In this survey, respondents are making a distinction between how they perceive science and religion more broadly versus their own day-to-day religious beliefs; implying that a process of compartmentalization is happening when reflecting on where conflict emerges. Also connected to this theme is the way people make sense of science and religion in their own personal lives. In both the interviews from the first phase of ECLAS research (with senior church leaders) and in the second (with church educators), the theme of "compartmentalization" emerged. This "compartmentalization" occurred in one of two ways: as a strategy for managing personal identities, or as a framework for which to understand science and religion more broadly. In the case of the former, "compartmentalization" occurred in those who wanted to keep their scientific and Christian identities separate. In the case of the latter, it was less to do with identity per se and more to do with viewing science and religion as being "independent" (in keeping with both Barbour's category of "independence" and Stephen Jay Gould's "nonoverlapping magisteria").

In terms of identity, it has been widely documented that "compartmentalization" is used as a strategy for avoiding conflict between religious and other forms of identity such as sexuality (Ganzevoort et al. 2011), sports (Stevenson 1997; Allen-Collinson and Brown 2012) or while studying at university (Reid 2017). In the case of my research, a senior Baptist minister recalled a time when he asked the director of a pharmaceutical company to take part in a question and answer event at his local church. He noted that the scientist was unable to "connect" his professional knowledge of science with his identity as a Christian. He added "I think an awful lot of professional people, not just scientists, leave their professional heads at the door of the church and pick them up when they come back out […] it's one of the most common complaints of ministers" (Participant 8, Senior Baptist Minister). Similarly, participant 6, a Cathedral Dean, stated "I saw a lot of scientists who lived their lives in boxes. So, faith was here and science was here. I did quite a lot of work to try to get them to bring the two things together." This compartmentalization also emerged in the form of "de-skilling" or taking a "*tabula rasa*" (Latin phrase often translated as "blank slate") approach to ordination training. The following interaction illustrates the point further:

> **Theological educator 5**: I remember going through a process of being de-skilled when I was at theological college and not really understanding why that was happening or…
>
> **Interviewer**: What do you mean de-skilled?
>
> **Theological educator 5**: Well it did feel as though, you had a whole bunch of people coming from various backgrounds, and it felt as though whatever you were, whether you were a teacher, a nurse, a doctor or a lawyer or whatever; it felt as though all your previous experience was never even

referred to, and there was no place for it to be acknowledged or used in the learning community. I remember experiencing that and thinking how odd it felt, how slightly humiliating it felt […] I still think we are not very good at acknowledging how somebody's existing educational role relates to their training and their formation for ministry.

While I encountered this particular narrative, I did also come across educators who were taking active steps to encourage ordinands to take an integrated approach to their identities. Participant 7 provided a particularly passionate account of this:

Interviewer: Can you tell me a bit more about what the tabula rasa approach is?

Theological educator 7: When somebody goes to college, all their previous experience is ignored, they are effectively deskilled and then through a psychological process they are kind of built up as a minister. And actually I think that is incredibly damaging and abusive so I won't go along with that. So I encourage people, particularly if they are self-supporting and they are working in a secular field like say [the] scientific field and many of them are as leaders like the professor I mentioned. I encourage them to draw on their experience in the widest possible sense to, in their assessment to show that they engaged in their formation right across the board. That is not always possible because there is a tendency for the curates to be focused on the parish ministry that they are doing and they think, oh it is so exciting, it is new, I want to really get on with this and for a while they don't make connections but then neither do they make connections with the formal theology that they have done before they were ordained. So our job is to help them in that integrative process so that all of life and all of learning becomes one whole which is slow and probably doesn't happen in the two or three years, well three or four years we have them.

Also connected to this idea of compartmentalization was the dominance of the humanities—both in terms of the framing/shaping of teaching and also in the backgrounds of people who train for ordination. A particularly interesting example of this was a passage from one interviewee reflecting on a conversation they had had with a student. This student was from a science background and was complaining about how difficult it was to switch into a different mode of thinking for his ordination training, participant 11 elaborates;

He was a microbiologist by training, very well qualified, had been working for multinationals and leading projects […] that kind of stuff, and he was just venting his frustration because he said: "I am a scientist, I go into a lab and I think I know something, and I do an experiment, and then I really think I know something, and then I do the experiment again, and, I know, I know something. And he said, [in] Theology Barth says this, Brueggemann says this, Brunner says this, urgh. And I said, welcome to the humanities. You know and a lot of it is about paradigms of knowledge, and what is

valid, and what do we know, and the difference, in that […] Theology is, in one sense, not empirical. **(Theological educator 11)**

Participant 11 was the only church educator to emphasize the point that natural scientists might struggle more to adapt to the "paradigms of knowledge" required for ordination training. However, the distinction between the humanities and sciences was also a phenomenon I encountered in the first phase of ECLAS research with senior church leaders. During the recruitment of participants, a Church of England bishop declined to be interviewed based on having been "educated in the world of 'two cultures'." This was a reference to a famous Rede lecture given by C. P. Snow in [1959] at Cambridge University where he stated that "the intellectual life of the whole of Western society is increasingly being split into two polar groups…at one pole we have the literary intellectuals…at the other scientists" (Snow [1959], 4). His thesis has become shorthand for a split between the humanities and natural sciences with a tendency for students and academics to remain isolated in their relevant subject areas. It is clear that the bishop was referring to himself as someone who belonged to the humanities or literary sphere and as a result did not feel able competent to take part in the interview. Crucially, however, C.P Snow himself was a scientist and writer, and his lecture aimed to highlight and challenge this separation of academic spheres; whereas the bishop was using it to justify his own nonparticipation in the interviews.

Interestingly, several interviewees raised the importance of ordination training taking a genuinely "interdisciplinary" approach and, if this was fully endorsed, then separate paradigms of learning would be less of an issue. However, when asked which aspects of science ought to be taught on the syllabus, participants overwhelmingly suggested the "philosophy of science" and (a much smaller number) the "methodology of science." The former is arguably an extension of the humanities approach but the latter could open discussion from both a humanities and science perspective.

CONCLUSION

Moving Beyond "Fear" Reflections from Cosmologist and Theologian: David Wilkinson

The data presented in this article resonate strongly with the experience of those of us who have been working, in the terminology of Ecklund, as "boundary pioneers," navigating the academic terrain of science and theology (Ecklund 2010, 46). A significant feature of this boundary has been a number of scientists who have become professional theologians (e.g., Polkinghorne 1995), on-going professional scientists who have contributed to taking the nature of theology seriously (e.g., McLeish 2014)

and celebrity scientists who have raised theological questions within public discourse (e.g., Giberson and Artigas 2007).

Although the quality of theological engagement has varied, the work of Hawking and Dawkins in particular has fueled popular interest in the big questions of science and religion both inside and beyond faith communities (Reid 2019). Best-selling books, television series, podcasts, live shows and debates, and even biographical movies such as *The Theory of Everything* have begun to break down the two cultures approach and renewed a confidence in science that was questioned by the growth of postmodernity (Alexander 2005). Therefore, it is not a surprise to learn about the high level of enthusiasm and engagement in general by clergy concerning science. Yet the conflict model underlies the approach of Hawking and Dawkins and is attractive to media producers who believe that controversy leads to viewing figures and sales. Here the contrast in the nature of the boundary between the academy and the public sphere could not be sharper. The conflict model has long been dismissed by historians of science (Harrison 2015) but remains embedded in the media and at certain level of primary and secondary education (Astley and Francis 2010).

The temptation, in order to avoid the conflict model, is to adopt compartmentalization. The motivation for Gould's NOMA model was to avoid the clash of science and religion within the public sphere of U.S. education but the research presented here shows a similar temptation within UK church leadership. As I suggested in an earlier paper, the adoption of a how/why distinction between science and religion appears to be an avoidance strategy by some church leaders (Bouveng and Wilkinson 2016). It avoids any difficult questions being posed by science to religious belief and may ensure that theologians and church leaders retain authority in religious belief.

The fear shown by church leaders in addressing publicly the claims of science is therefore at many levels. Fear stemming from lack of knowledge of science may be coupled with a lack of knowledge of scientists themselves. Science is a human activity and can only be understood with reference to beliefs, values, and personalities of professional scientists. The stubborn existence of the conflict model alongside its use in public discourse by celebrity scientists puts church leaders immediately into a defensive posture not only in truth claims, but also in a sense of status within culture.

The questions that this raises for the training and formation of church leaders are profound. First, how do theological educators affirm science as a gift from God and affirm both the student's enthusiasm for and engagement with science? This means the valuing of the skills and expertise of the person who has already worked in science while taking seriously the support needed to utilize such gifts within a different academic discipline. This can be done in a number of ways in the curriculum and we

will come on to this in a moment. However, we should not neglect the power of senior church leaders modeling an engagement with science that is not characterized by fear. Fear and hesitancy about science from senior church leaders has a trickle-down effect eroding confidence in clergy and laity. Second, how do theological courses engage science? Perhaps the worst thing is to put these issues into a silo of a course in science and religion taught by specialists for those who are already interested in the subject. Rather can teachers engage science within the classic disciplines of theology, showing its relevance to church history, philosophical theology, systematics, ethics, and biblical studies? But science-engaged theology is more than just content translated to the church leader in training by a sympathetic Christian theologian. Science-engaged theology is about theologians engaging in authentic dialogue with scientists. This will mean the invitation of scientists into the classroom of the seminary or course, with the attendant risk that some will represent conflict or compartmentalization as well as dialogue. Third, how do theologians see God at work outside of the church in creation, redemption and in the work of the Spirit? It is a lack of this theological vision that engenders fear, insularity, and an attempt to hold onto authority by the church. Overcoming fear can be replaced by an expectancy that God is at work at the boundary and a humility that we do not know and do not need to know all of the answers. The skill of a theologian and indeed a scientist is to be able to discover the right questions.

Concluding Remarks

The aim of the research reported in this article has been to provide a snapshot of how clergy and church educators understand the relationship between science and religion against the backdrop of popular media's tendency to portray science and religion as being in conflict. One of the key observations to emerge has been that despite the relationship between science and religion being framed as one of "conflict" in the media, this was not the prevalent view among the church leaders and educators I surveyed and interviewed. Indeed, many church leaders were enthusiastic and complimentary about science; viewing the relationship as one of "integration" or "dialogue." Nevertheless, the conflict thesis had framed the way in which church leaders *related* to science—with expressions of fear and uncertainty being reported by church leaders, and in the clear omission of science topics in ordination training in a UK context.

There is a clear discrepancy between the degree of enthusiasm reported by church leaders and their subsequent hesitation or fear in talking about science in the public domain. One of the potential key drivers in shaping how clergy view science and religion can be found in ordination training. However, as demonstrated by the mention of "tabula rasa", such an

approach can lead to theological training not being able to subsume or contextualize previous scientific knowledge. Instead, the tabula rasa approach *silently* implies the irrelevance of science thereby allowing existing stereotypes to persist. In view of the latter, Wilkinson's contribution as a theologian and scientist goes one step further in asking the reader: what *should* theological and scientific engagement look like? It is only in beginning to take this question seriously, (alongside engagement with scientists, theologians, and educators) that clergy will begin to have the tools to comfortably engage with science and religion in the public domain.

Notes

1.   It is useful to note that the Pew survey was carried out in the United States and there are obvious cultural differences when reflecting on the sample in this article versus Pew's sample. Although it is useful to make comparisons between the two—the samples are not like for like.

2.   The survey component of the research was carried out under the guidance and support of Dr. Tim Drye (a professional statistician) who advised on the questionnaire design, sampling techniques, and analysis of the data. Due to the specific nature of the sample, a traditional sampling technique (such as those used by research companies) could not be carried out. However, both the statistician and project team members aimed to reduce the bias in sampling by employing a technique that aimed to include those who might feel indifferent to science. This is explained in more detail under the "Methodology" section.

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