

1 Introduction: *Memento Naturam*

Science-engaged theology aims to serve as a reminder to theologians that the local tools and products of the sciences ought to be sources for theological reasoning. Put another way, it leads to better theology if we remember to ask, what methods or tools could help me improve this claim I am making about the empirical world? Often, these will be tools and methods from the sciences.

Theologians make scientific, or science adjacent, claims all the time, particularly when discussing topics like theological anthropology, nature, ecclesiology and ethics.¹ Sometimes these questions will be practical. Can intersex persons be ordained as Roman Catholic priests? Should we give people experiencing a dark night of the soul antidepressants? Is praying for those who persecute you of therapeutic benefit? To answer any of these questions, at the very least, theologians need an accurate and nuanced understanding of the physical and psychological situations at hand. At other times science-engaged theology is not so immediately practical. What are the cognitive processes involved in faith or hope? How do spiritual practices impact character formation? What is God's relationship to more-than-human animals? These are theological questions about empirical realities. The basic principle of science-engaged theology is that whenever theologians make claims about created, empirical realities, they should incorporate the insights of empirical investigation into their analysis.

So, one way to understand the mindset of science-engaged theology is as a way to place scientific research *alongside*, not in competition with, biblical exegesis, the study of history, or philosophical considerations as a ready resource for theological reflection. No self-respecting theologian believes that they can do theology without considering what the Bible or tradition has to say on their chosen topic. We think that theologians should have a similar instinct when drawing on empirical studies.

As Renaissance Christians used art as occasional reminders of mortality, calling them *memento mori*, you could think of science-engaged theology as a *memento naturam*.² Needing such occasional mementos isn't at all unprecedented in

¹ Barrett 2022.

² Of course, this translates as 'remember nature', rather than 'remember scientific tools and findings', but the alternative, *memento scientia*, would be confusing for different reasons. The term science has a complicated backstory. For Aristotle, any system of demonstrably certain knowledge was a science (ἐπιστήμη). Within the medieval university curriculum, a *scientia* was any of the seven liberal arts, sometimes extended to include mathematics and *sacra doctrina*. Based on this, you might expect us to say, 'Theology can be a science too!' That may be true in a sense, but we use science here to mean something narrower. The broader sense is best conveyed by the German *Wissenschaft*, the products of all academic fields including the humanities. We have in mind the narrower sense of empirical investigation, roughly associated with the Scientific Revolution, the discoveries of Galileo and Newton, and the development of various systematic, experimental methods such as Bacon's.

Christian history. When John and Charles Wesley began the Methodist movement, they reminded the church that the experience of the faithful can be a guide and authority for doctrine and practice. When Martin Luther, together with Catholic reformers like Erasmus, advocated for a vernacular Bible, they encouraged remembering Scripture as an authority and source. Reminders are often needed as a corrective, and this is true for science-engaged theology.

Science-engaged theology is a corrective against the tendency for academic specialization to entail ghettoization. Unlike many attempts at interdisciplinarity, we applaud increased expertise and concentration in research, but think this only increases (rather than decreases) the potential for meaningful collaboration. Furthermore, the need for collaboration persists even though specialization in theology often includes highly particular faith commitments that colleagues might not share. This has led some theologians to suggest that confessional theology *belongs* in an intellectual silo, protected from the distorting effects of modernity. On the contrary, science-engaged theology is a reminder that theology is a task best done in diverse community, not only in monastic or church communities but also in multidisciplinary research settings like the university.

As with all human endeavours, there are better and worse ways to do theology, including better and worse ways *to remember that science can be a theological source*. Treating science-engaged theology as a mere slogan would be simplistic. What we mean by ‘slogan’ here is when a good insight becomes a blunt weapon that flattens a complicated and nuanced picture. Something similar happened to Luther’s concept of *sola scriptura*. Luther had a relatively nuanced – at least, nuanced for Luther – understanding of the Bible’s place among other sources of theology. This quickly got co-opted into a slogan that would be better named, not *sola*, but *solo scriptura*.³ For Protestant neo-scholastics and, even nowadays, certain American neo-Calvinists, Luther’s reasonable proposal morphed into the unreasonable idea that the Bible can stand alone. Likewise, we do not want science-engaged theology to become a backdoor for naïve scientism within theology. Science does not, and cannot, stand alone. With this cautionary tale in mind, this Element seeks to remind theologians that science ought to count among the sources of Christian theology, while providing clues about how to do this well.

1.1 Three Initial Reactions

Science-engaged theology is far from our own invention.⁴ Lots of scholars have recently been calling their work ‘science engaged’ and, of course, different scholars mean different things by the phrase. Like all concepts, science-engaged

³ Vanhoozer 2005, 154.

⁴ Perry and Ritchie 2018 seem to have been the first to use the term in print.

theology emerged from within a community and continues to be shaped by the scholarly interactions of that community. One of the primary purposes of this Element is to allow that community to grow. As such, we thought it helpful to bring readers up to speed by outlining three initial reactions that we have heard over the last few years which have shaped our vision of science-engaged theology. One consequence of this choice, however, is that the remainder of this section jumps directly into some of this Element's thorniest issues, most of which will be returned to with more introductory exposition at later points. Some readers may prefer to jump ahead to Section 1.2.

1.1.1 Well, Obviously

The first reply, the most supportive of our position, could be summarized as, 'well, obviously!'⁵ As the rational and personal Creator of the universe, *of course* God speaks through science, and *of course* theologians should listen to all the ways God speaks. Christians have known this for millennia and have studied it systematically since the Middle Ages. In fact, Christian beliefs were a major driver behind scientific pursuits for most of Western history. Why would the church stop now?

We agree! One minor caveat: we should not confuse 'science' used broadly to refer to the way people throughout history and in different cultures have used observational evidence to solve problems, with 'science' used more narrowly, referring to the tradition and social institution with historical roots in sixteenth- and seventeenth-century Europe. Any given Christian – along with well, basically everyone on the planet – understands science differently nowadays than they did in earlier eras; differently, for example, than did medieval Italian priests working in Parisian universities. The difference is one of degree rather than kind, but it is a difference nevertheless – one which is knotted with historical threads that some sections of this Element attempt to unpick. So even those who see science-engaged theology as obvious, us included, could use occasional reminders that God doesn't speak through science without the need for interpretation. As we argue later, what science 'says' is always historically, politically, philosophically and even geographically contingent.

1.1.2 Science Distorts Theology

The second reply is not supportive. It goes something like this: 'science is a corrupt and biased institution. If Christians use the tools of modern science, they will also corrupt theology'. This is a pseudo worry. Most reflective scientists,

⁵ Grey 2021, 491–2.

such as our university colleagues, *know* that science as an institution is complex and susceptible to corruption and bias. They already take it for granted that scientists disagree with each other, that their findings are always in process and provisional, that the mechanisms of power and prestige play into any equation and that any knowledge we claim to discover is relativized by those facts. But this is true of the humanities (including theology) as well as the sciences.

There is a different version of this objection, which we have heard on more than one occasion, which the final sentence of the previous paragraph may appear to aggravate. This second worry about science potentially distorting theology goes something like this: ‘engaging the sciences inevitably puts theology on the back foot and tricks theologians into trying to prove that their claims meet some secular criteria for truth or evidence’. This objection will be dealt with in various places throughout this Element because it is one we are sensitive to and wish to avoid. Science-engaged theology does *not* imply that all theological claims need to be verified, or even corroborated, by the sciences in order to be meaningful or rational. This worry may have been aggravated by the admission in the previous paragraph that theology too is biased and not always reliable. But readers with this concern should note that this comes after agreeing that the sciences are in a similar position. It is, in part, because of universal human fallibility that we think that opening oneself up to multiple sources of correction is an epistemic virtue, and for theologians this includes accountability to empirical inquiry when making empirical claims.

We acknowledge that using the sciences as a source in theology does give science some measure of theological authority. This is not the same as scientism. For a host of reasons explored in later sections, we do not think ‘but science says so’ should be used as a lazy trump card to win theological debates. So, how much authority *should* theologians give the sciences? In brief, this will depend upon the question one is trying to answer and the theological tradition to which the theologian belongs. It is okay if Mennonites ‘remember science’ differently than, say, Roman Catholics or Liberal Protestants.

1.1.3 Undermining the Truce

We can introduce the third reply by recounting what has, improbably and somewhat infamously, become a flashpoint for early conversations about science-engaged theology. *Can gluten-free bread be consecrated for the Eucharist?* How could that be contentious? For some critics, the question implies that the sort of problems that science-engaged theology can help with are simply too silly. *What’s next, angels dancing on a pin?* Well, if you are a Catholic with coeliac disease, the question is anything but silly; however, we

surmise that this objection goes deeper. This is worth considering because we never envisioned this example as the best, most robust kind of science-engaged theology. It is probably better understood as a minimalist example; *at least* everyone can see that organic chemistry (which discovered the protein $C_{24}H_{27}N_5O_9$) can be useful to theology in questions such as these. So when early interlocutors objected even to this, we thought it worth pursuing.

According to some, it seems that our framing of the gluten question imperils the truce between science and religion. For centuries, so the story goes, scholars representing both camps were mistakenly at war. How could you be at war *mistakenly*? Imagine John is the mayor of Cambridge and runs attack ads against Joanna, who he hears also wants to be mayor of Cambridge. Perhaps they each claim that they got the most votes; maybe John even sends the city police after Joanna for the alleged coup. The police find that Joanna *did* get the most votes – in her hometown of Cambridge, England. John, it turns out, was mayor of Cambridge, Massachusetts. The cities should have been at peace all along. So too for the so-called conflict between science and religion. If John claims, ‘gravity is a universal force proportional to mass’ and Joanna claims, ‘God created gravity’, our claims are not in conflict. They could have been at peace all along. But *realizing* the war was mistaken after the shooting starts takes lots of peace planning. The truce is fragile; the generals want to keep things going for the military-industrial complex and so on.

If *that* describes the relation of science and religion – a fragile truce after a war where the territories were never in conflict – we can see how asking, ‘can gluten-free bread be consecrated?’ threatens the hard-won peace. Such a question could (wrongly) be taken to imply that whatever science says about the nature of gluten might somehow dictate Vatican dogma. Since gluten is not in the same conceptual territory as consecration, why confuse matters?

We call this counter argument to our vision for science-engaged theology, *NOMA on steroids*. Non-overlapping Magisteria (NOMA) is the view that theology speaks for values or morality, which aren’t empirically discoverable, and science speaks for facts, which are. For many, this division of labour is the basis of the truce; ‘Science studies how the heavens go, and theology studies how to go to heaven’. There is some truth behind this cliché. The questions typically asked by empirical scientists are not those typically asked by theologians, and vice versa. Perhaps this is fine some of the time. But the *on steroids* bit gets added when NOMA becomes a hard and fast metaphysical rule. One scientist who espoused this view to us said, ‘the Church, being social constructivists *par excellence*, doesn’t have to adopt the categories scientists use: a human being is whatever she [the church] says it is, and so is a man or a piece of bread’.

A generation ago, the theologian James Gustafson pejoratively called such thinking, ‘Wittgensteinian fideism’.⁶ The position holds that the church has its own language game, and all definitions are internal to that game. Whenever Christians say, love or violence or worship or justice, what they mean is ‘love’, ‘violence’, ‘worship’ and ‘justice’ understood *from within the Christian narrative*. We affirm that theologians must examine the world and everything within it from the perspective of the Christian narrative in all its scandalous particularity. But that narrative does not itself claim to be private, it claims to be universally true and to apply to the physical universe. Far from making theologians rulers of other disciplines, this claim means that theology holds itself partially accountable to the empirical discoveries of others.

Whether we call their position NOMA on steroids or Wittgensteinian fideism, if these critics are right then science-engaged theology is a useless endeavour. Why indeed imperil the truce between science and religion? If, however, the critics are wrong, if there are sound theological reasons against such views – as we argue – then the discipline of theology could very much use a *memento naturam*; a reminder that science is one of the ways that Christians have learned to listen to God.

1.2 Science-Engaged Theology Done Well

In Section 1, we wrote that we don’t want our reminder to be simplistic, such as could happen if it became a mere slogan. Christians have more or less always seen the science of the day as a source for theology, but since the dawn of modernity, and especially since 1800 or so, a series of debates have muddied these waters. It would be naïve of us to simply endorse using science as a source for theology without consideration of these muddy waters, and likewise naïve to overlook the work that already has been done to clear the water – which has made science-engaged theology possible. We want to fill in all this background before giving our positive account of what science-engaged theology is in Section 5. It is helpful to phrase these prior debates as three questions, each of which we will address in a section of this Element.

- How can theologians use science as a source given the apparent fragile truce/war between science and religion? We will answer this question in Section 2 by discussing how science-engaged theology relates to the pre-existing field of science and religion.
- How can theologians employ scientific tools given theology’s marginal place in the modern university? In Section 3, we make an intervention into these

⁶ Gustafson 2013, but the term is originally from Nielsen 1967.

ongoing debates about the identity and position of theology in relation to other disciplines.

- What is it that theology is meant to engage with? We will explore the question of scientific unity and disunity in Section 4 with the help of twentieth-century philosophy of science.

Having cleared these muddy waters our constructive proposal is built in response to a further three questions. Why science? What is a source? How should this source be used, exactly? In Section 5, we speak more positively of what it means to remember that the sciences are among the sources of theology.

Our overall argument might be summarized in the following way. It turns out that the much-hyped war/truce between ‘science’ and ‘religion’ is not what it appears, because these disciplines are not two distinct natural kinds or transhistorical categories, but socially contingent groupings of diverse and intertwined knowledge-seeking enterprises. On the one hand, some have used science as a proxy for rationality or emancipation and religion as a proxy for superstition and oppression. On the other hand, others have sought to declare theology queen of the sciences. Only after dissolving these petty power plays can we see that science-engaged theology is a sign of theologians’ quiet confidence in their position in the university. Developments in twentieth-century philosophy of science strengthen this claim further by speaking of the plurality of the sciences. The sciences only *appear* unified through the disjunctive continuity established by trading zones and pidgin languages. These are the spaces and skills that science-engaged theologians should seek to join and practise.

Science-engaged theology is a disposition for theologians to modestly use the best available tools when making empirical claims, alongside (and not in competition with) all the other sources and tools that a theologian uses to know God and all things in relation to God. We provide short examples of science-engaged theology by incorporating weblinks to the work of others throughout our text; offline readers will find the links collected in the appendix.⁷ Using science as a source is one thing, doing so well is far more difficult. To that end, we conclude this Element with rules of thumb to point out where the pitfalls lie and how to best avoid them.

2 Beyond the Territories of Science and Religion

We’ve all heard that science and religion have been at war. And in dialogue. And have nothing to do with each other. So, which is it? Scholars have been asking this question for a while now; we ought to have some idea. Almost a century ago, here’s how Alfred North Whitehead began an article in *The Atlantic*:

⁷ Sometimes these examples exemplify something we are discussing in the main body of the text, at other points the link is more tenuous. We advise readers not to overthink their placement.

The difficulty in approaching the question of the relation between Religion and Science is that its elucidation requires that we have in our minds some clear idea of what we mean by either of the terms, ‘religion’ and ‘science’. Also I wish to speak in the most general way possible, and to keep in the background any comparison of particular creeds, scientific or religious. We have to understand the type of connection which exists between the two spheres, and then to draw some definite conclusions respecting the existing situation which at present confronts the world.⁸

Here, Whitehead typifies the way that many have approached the question: look for some lowest common denominator that lies at the core of ‘religion’ and ‘science’ to make sense of the relation between these monoliths of human civilization. Leave the scientific and religious specifics out of it because what we are looking for is an essential core. Keep it generic.

We will not judge whether this plan ever made sense, but this Element advocates a different approach. Instead of keeping ‘particular creeds, scientific or religious’ in the background as Whitehead wanted, science-engaged theology keeps them front and centre. Rather than a school or method, science-engaged theology is a mindset which any theologian of any camp or tradition could (and we think should) adopt. Theologians do not need to set aside their particular faith and denominational concerns and commitments. The mindset of science-engaged theology can be expressed as when a theologian asks a simple question: what methods or tools could help me improve this claim I am making about the world?

We agree with Whitehead, however, that you can’t study everything all at once, so our approach leaves some things out too. What we strive to ‘keep in the background’ is precisely the search for a core. Why? First, because we doubt there is any essential core to be found in categories as broad as religion and science. Second, because the quest for the essence of ‘science’ or of ‘religion’ has been politicized throughout modernity. We cannot study what’s essential to this or that concept without also asking who benefits from using that label. Finally, looking for cores to science and religion, as Whitehead does, prioritizes certain archetypal cases that make a generic relation most obvious, either with now-clichéd anecdotes of conflict (‘Christians believed the earth was flat until Columbus’) or independent harmony (‘science studies how the heavens go, religion how to go to heaven’). While they may have started as historical episodes, such archetypal cases are often mythologized by science and religion discourse, such that they bare little relevance or similarity to the daily mess of theological or scientific enquiry.

It has been a century since Whitehead posed his question – what is the relation between science and religion? – and it’s now common for scholars to admit that

⁸ Whitehead 1925.

it cannot be categorized as one simple story or metanarrative. Are they in conflict or can they help each other out, or do science and religion simply ask different questions? Yes. And yes and yes. History is always messier than the easy tropes we find so useful. But can we say more than, ‘it’s . . . complicated’? We think so. In fact, the goal of this section is to tell the stories behind the story of why it’s so complex, why we can say more and begin to explain why science-engaged theology isn’t, and shouldn’t be, about how ‘science’ and ‘religion’ relate.

The history of science and religion is best told not as a story about Galileo, Newton and Darwin, but as a story about the stories we have told and continue to tell of these two disciplines: in other words, a historiography. As Peter Harrison argues, science and religion are not transhistorical categories that we can track throughout different epochs, but imagined concepts that, as a result of certain theories of secularism, have come to be defined in opposition. Even though the myth of conflict has been abandoned by all serious historians, as long as we are asking questions about how something called ‘science’ relates to something called ‘religion’, we are setting the stage for misunderstandings, misconceptions and myths.

In this section, we answer the question posed in the introduction: how can theologians use science as a source given the apparent fragile war/truce between science and religion? Our answer is organized under three headings. First, Double Mythbusting (Section 2.1) challenges the appearance of a fragile war/truce. We argue that the ‘war’ and ‘truce’ purport to be myths of *history* but are, in fact, built on myths of *historiography*. Second, Countless Typologies (Section 2.2) argues that the enthusiasm in the field of science and religion for building typologies has been a misguided attempt to grapple with the consequences of an increasingly complex picture. Third (Section 2.3), we use the arguments of three Gifford lecture series, by prominent historians and geographers of science, to explain how science-engaged theology hopes to move beyond the acknowledgement of complexity onto something more constructive.

2.1 Double Mythbusting: The Myths (of the Myths) of Conflict and NOMA

We are not opposed to myths. As teachers, how could we be? Myths allow stories to convey lessons. Even apocryphal stories can be useful; the problem with myths is not necessarily their grounding in history. Whether or not Laplace ever told Napoleon, ‘I have no need of that hypothesis’, it can be a useful teaching tool to express the concern that the Newtonian universe can lead to Deism. Nor is it a problem that myths simplify complex stories. Good teachers simplify and narrate; it’s how teaching works. On the other hand, some myths

include implicit lessons that the teacher does not intend, and the result is that the student is misled. The more often the teacher tells the myth, the more likely it is that they too are being misled by their own pedagogy.

2.1.1 *The Myth of Conflict*

In this section, we look at how the myths of science and religion, of which the conflict thesis is only the most well-known, are created by making smaller stories paradigmatic for a larger narrative. Put simply, the myth of conflict holds that science and religion are wholly incompatible such that individuals and societies must choose a side. This dichotomy is propped up by the oversimplification, and sometimes outright misrepresentation, of individual historical episodes or debates: the discovery that the Earth is not flat, Galileo's imprisonment for teaching heliocentrism, the notion that religions assumed poor mental health was demonic possession until the advent of modern psychiatry, the idea that you can't believe in God and evolution at the same time. Each of these individual debates are massaged to fit into a predetermined metanarrative of inevitable conflict between two eternal monoliths, 'Science' and 'Religion'.

For example, in his influential *History of the Conflict between Religion and Science* (1875), John William Draper tells the story of how 'the theological doctrine of the flatness of the earth was irretrievably overthrown' by the voyages of Columbus and Magellan. Here we have a clear Whiggish history of inevitable scientific progress, and it seems that such progress must be made at the expense of religion. Draper writes, the 'irreligious tendency [of Columbus' planned voyage] was pointed out by the Spanish ecclesiastics and condemned by the Council of Salamanca' using Scripture and the Church Fathers.⁹ Draper's account is mostly nonsense, of course. The shape of the Earth had been well established, including among Christians, since at least the 600s – so nearly a millennium before Columbus – and among some Greeks, a millennium before that. But the story goes that Draper's book, together with White's *A History of the Warfare of Science with Theology in Christendom* (1896), founded what historians came to call the conflict thesis or conflict model.

In due course, historians realized that the conflict thesis was more like a conflict myth. Draper and White invented whole episodes and took quotes out of context, which is ably summarized in Ronald Numbers' *Galileo Goes to Jail* and elsewhere.¹⁰ Few scholars since the 1980s consider either Draper or White to be reliable sources. By showing that the promoters of the conflict model 'read the past through battle-scarred glasses', Numbers and the other

⁹ Draper 1875, 160–1.

¹⁰ Numbers 2009. And elsewhere, including Lindberg and Numbers 1986, 140–9.