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Confession and the Scientist-Theologian

Science as a Religious Activity

The very title of the “After Science and Religion” project suggests that all is not as it should be with the current shape of Science and Religion as a scholarly discipline. The project presses the need to de-essentialise the discipline’s understanding of the ‘science’ and ‘religion’ categories, and it critiques the current state of the relationship between the modern sciences and theological enquiry. In this article, it is argued that the project has adopted too distant a stance with respect to the modern sciences, and is therefore unable to account for the sincere ‘confession’ of the scientist-theologian in the modern professional sciences, a confession which shows that positive theological engagement with the sciences is possible in spite of the caution of the “After” project. The details of this confession are introduced through Philip Hefner’s commentary on the personal contributions of John Polkinghorne, and are then expanded through a special focus on Charles Coulson’s classic (but largely forgotten) book of 1955, *Science and Christian Belief*. Coulson’s ‘act of reflection’ provides a means for recognising the rich theism that can flourish in scientific practice, to such an extent that we might follow him in speaking meaningfully of ‘science as a religious activity.’

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1. Introduction

The “After Science and Religion” project, which produced two published collections of articles from various scholars in the humanities and sciences (Harrison and Milbank 2022; Harrison and Tyson 2022a) has provided a valuable corrective to the science-and-religion field. The project injects a renewed confidence into theology’s encounters with modernity, and it argues robustly for a move away from the essentialised caricatures of ‘science’ and ‘religion’ which dominated science-religion discourse until recently. The “After” project is also notable for its rich historical nuance, especially in the flagship *After Science and Religion* volume (Harrison and



Milbank 2022). However, for all its successes, that latter volume overlooks important ways in which existing work in science-and-religion scholarship has already achieved some of the volume's aims, raising the question of whether the volume's call for an 'After' phase might not be somewhat premature¹. Accordingly, this article takes a more recent historical focus than that of the *After* volume, emphasising the personal role of the 'scientist-theologian' in achieving close theological engagement with the sciences.

The flagship volume's "Introduction" and "Conclusion" (by Paul Tyson and Peter Harrison, respectively) summarise the main claims made in the book about theological engagement with the modern sciences. The rise to cultural supremacy of the sciences has led to a "reversal" (or at least a weakening) of the once-dominant influence of theology upon society; theology must now submit or risk becoming irrelevant (Tyson 2022, 5–6; Harrison 2022, 317–18). As a result, "dialogue" between the modern sciences and theology is largely one-way, with theology all too often accommodating itself to the sciences (Tyson 2022, 6; Harrison 2022, 317). In principle, the sciences might be supposed to take a strictly neutral ("value-free"; Tyson 2022, 3) approach to theological and moral questions, but in practice the sciences are closely bound to scientism (5–6, 10), and to a wide-ranging naturalism that does not sit easily alongside traditional theological and ethical epistemologies (Harrison 2022, 322–23). As a remedy, the volume reminds us of the metaphysical and moral astuteness that was enshrined in the natural philosophy of previous centuries; perhaps a return to this astuteness might work a new balance in the conversation between the modern sciences and theology (Tyson 2022, 7; Harrison 2022, 318–19).

While many of these claims ring true for the culture wars between scientism and religious faith (such as in the "New Atheism" debate of the 2000s), it is by no means clear (to me, at least) that such claims can be made across the board of the modern working sciences without, effectively, essentialising the sciences all over again into 'science.' Hence, the case would be more secure, I suggest, if it could be made by means of specific examples taken from across the diverse range of modern scientific practices and interpretations. But we see little of that kind of close and granular engagement in the volume. Instead, the *After* book takes a largely distant view of the mod-

1 Or, at any rate, it might be premature if, by "After Science and Religion," we mean "After the *disciplinary entity* of science and religion." If, on the other hand, we are speaking of "After the *essentialised categories* of science and religion" – and of the ways in which the myth of conflict is embedded in those categories – then, for sure, I agree that the *After* volume makes a good case for moving on. The trouble, I find, is that the *After* volume seems to suggest both.

ern working sciences, askance in places. Moreover, the book purports to address contemporary science-religion discourse, but the book does not examine the many ways in which science-and-religion scholars are seeking to interpret live scientific problems today. Instead, there is much harking back to the distant past, including to the merits of ‘natural philosophy’ as a more theologically-friendly precursor to the ‘science’ of today. Occasional chapters tell of the glories of the modern sciences (e.g. Soskice) and of their spiritual demands (e.g. Ip), but these are insufficient to counteract the overall tone of critical detachment of the volume. The impression is given that the modern sciences give theology more cause for concern than for celebration.

For myself, I can see many more causes for theological celebration in the modern sciences than concern. The distancing that I detect in the volume between the sciences and theology does not reflect my own vocational experience as a ‘scientist-theologian’ who is concerned with theological interpretation of the modern sciences². And it is worth noting that a fellow scientist-theologian (Tom McLeish), who contributed to both volumes, also hints at much the same observation when he mentions the “apparent conflicts and disjunctures” in the *After* volume’s other chapters, and especially where scientists are seen by the other contributors as an “alien community” rather than as fellow enquirers who practice a “shared ‘liberal art’ with a God-given purpose” (McLeish 2022, 278). Likewise, a review written by another scientist-theologian points out that substantial parts of the *After* volume miss the mark by failing to engage with the modern sciences and with modern scientists (Alexander 2024). I am not alone in my misgivings then.

For all its historical strengths, I suggest that the *After* volume would have found some inspirational answers to the questions it asks if it had looked at the relatively recent history of the science-and-religion area, specifically the mid-twentieth to early twenty-first century. In this article, I draw attention to the figure of the modern ‘scientist-theologian,’ who, I submit, is the true successor to the natural philosopher of yore, embodying (in her own person) a thoroughly anti-essentialist solution to the problem posed by the *After* volume, and a full engagement with her own scientific discipline. Highly prolific individuals such as Arthur Peacocke and Celia Deane-Drummond come to mind, not to mention Tom McLeish. Such individuals unite rigor-

2 Although, for reasons not especially relevant to this article, I tend to refer to myself as a ‘theologian of science’ these days instead of using the more familiar ‘scientist-theologian’ terminology that I discuss here. See Harris 2024 for my thoughts on ‘theology of science’ as a potential going concern within the wider discipline of science and religion.

ous scientific practice with a living religious faith and creative theological intelligence through their own personal identities. Accordingly, this article looks at two foundational scientist-theologians: John Polkinghorne (1930–2021) and Charles Coulson (1910–1974).

2. Confession and the Scientist-Theologian

My main title (“Confession and the Scientist-Theologian”) is inspired by vintage Philip Hefner, specifically a piece on John Polkinghorne, which Hefner entitles “Confessions of a Scientist-Theologian” (Hefner 1998). Hefner does not explain precisely how he understands the identity of the ‘scientist-theologian,’ but I am assuming that he means it to refer to an academic professional who has received training in both a modern scientific subject and in theology, since Hefner contrasts the scientist-theologian with the “ordinary” theologian who has no scientific credentials (535)³.

Hefner’s aim is to review John Polkinghorne’s now classic text of 1994, *Science and Christian Belief*⁴, but Hefner has the entire genre of science-theology literature in his sights. His take-home point is that:

Without wishing for a moment to denigrate the brilliant intellectual substance of Polkinghorne’s work or his intention to advance towards a cogent statement of truth, I would characterize his work (in this book and in much of his other work) and that of other scientist-theologians as a form of confession (533–34).

It is hard not to read Hefner as very actually denigrating Polkinghorne’s work when he (Hefner) goes on to imply that Polkinghorne’s truth claims are rather naïve compared with the more sophisticated grasp of myth and metaphor displayed by “ordinary theologians” (536). Similarly, Hefner suggests that *what* scientist-theologians propose in their doctrines is less important than *how* they do it, by an act of confession. This confession is the “most important locus of ontological truth” in these people’s work, namely “their conviction that reality makes itself available under the conditions of an integrated scientific and theological probing, rather than one or the other” (535). According to Hefner’s view of the scientist-theologian then, reality must submit to a cohesive and united science and theology.

3 It is worth noting that Polkinghorne’s own use of the term for himself emphasises his vocational identity rather than his formal academic credentials: “I am a scientist-theologian, someone who is both a physicist and a priest” (Polkinghorne 2007, vii).

4 Derived from Polkinghorne’s Gifford Lectures at the University of Edinburgh in the 1993–94 academic year, and published in the USA as *Belief in God in an Age of Science*.

While wincing at Hefner's apparent dismissal of Polkinghorne's doctrinal formulations – some of which have become benchmarks in the science-theology genre – I think that he (Hefner) is on to something when he identifies Polkinghorne's work as an act of confession. Specifically, Hefner's identification allows two points to be made. First, despite Hefner's misgivings about the content of Polkinghorne's doctrinal proposals, a scientist-theologian's 'confession' should be taken seriously as a legitimate mode of science-religion discourse. Second, that the scientist-theologian is able truly to integrate scientific and theological views of reality (more so than is the 'ordinary theologian') because the scientist-theologian does so in her own person.

Expanding on the first point, when seen as confession the scientist-theologian's account of 'this is what works for me' gains a credibility which allows it to be weighed alongside other, more mainstream theological accounts, such as those of 'ordinary theologians'⁵. What is more, the personal nature of confession means that the scientist-theologian's interactions with "ordinary theologians" who have no scientific training is *truly* a form of science-theology dialogue, according to Hefner (535). In this light, it is worth noting that the two volumes of the "After" project are critical of the 'dialogue' mode of interaction between 'science' and 'religion.' There, dialogue between science and religion/theology is usually "one way," it is claimed (Harrison and Tyson 2022b, 2–3), where religion listens patiently to what science has to say, and "often just amounts to theology and religion accommodating themselves to the sciences" (Tyson 2022, 6). But, and *contra* the "After" project's criticisms of dialogue, Hefner's appraisal of the scientist-theologian's confession suggests that dialogue can indeed be highly meaningful and productive when the scientist-theologian interacts with ordinary theologians. In such a context, the dialogue is "between disciplines rather than a dialogue within individuals" (Hefner 1998, 535); the sharing of joint theological interests between the two partner disciplines means that the dialogue is truly two-way.

Hence, and moving on to my second point drawn from Hefner's analysis of the scientist-theologian, I want to emphasise the *personal* dimension of what scientist-theologians achieve, reflecting on their impact on the science-and-religion field through its relatively short history. The early decades of the field (say, 1950s to early 2000s) were dominated by the phenomenal energy of a relatively small number of scientist-theologians: Barbour, Pea-

5 After all, who can forget that Augustine chose the form of confession for one of his greatest theological reflections on lived experience.

cocke, and Polkinghorne are invariably cited, but others such as R. J. Russell, Celia Deane-Drummond, and Denis Alexander have been equally effective through these years to the present day. Not only were the early scientist-theologians significant in the foundation of many of our academic societies and centres in science and religion – along with our conference series and publications – they all made highly distinctive contributions to theological thought by playing to their own scientific strengths; their contributions were nothing if not personal. Since the 2000s the science-and-religion area has broadened-out considerably in terms of interdisciplinary interests, research projects, numbers of researchers and influence. The area has effectively started to become a professionalised discipline in its own right, as shown, for instance, by the growth of specialist university programmes in ‘Science and Religion.’ In other words, science and religion has become normalised alongside other philosophical, historical and theological disciplines, with the upshot that the characteristically personal voice of the scientist-theologian is not as dominant as it once was. Hence, I wonder whether recent calls to retrieve the spirit of natural philosophy – as in the “After” project, but also elsewhere (e.g. McGrath 2022) – are not, in effect, yearnings after the once-prolific personal emphases of scientist-theologians such as Polkinghorne. My point is that, like the natural philosopher of old, *the scientist-theologian integrates scientific and theological perspectives personally and vocationally*, and at a very high level of expertise.

All this is not to imply that other academic specialisms do not have an equally significant vocational element in the science-and-religion area, but my aim is to highlight the particular identity of the scientist-theologian and the significance of her personal confession, using Hefner’s review of Polkinghorne as a starting point. Next, I will examine the identity of a somewhat earlier scientist-theologian, Charles Coulson. My objective here is to retrieve his own confession, because, apart from a few notable exceptions (e.g. McGrath 2019, 63–65), Coulson has been largely forgotten today.

3. Science as a Religious Activity

Charles Coulson (1910–1974) is best known in the sciences for his work in theoretical chemistry, pioneering the application of quantum mechanics to chemical bonding and molecular structure. Coulson was also a Methodist lay preacher, and he exercised an active social conscience, for instance, in the early Oxfam movement. In the 1950s he explored his interests in the vocation of the scientist-believer through a series of public lectures, and

these made him one of the foremost British thinkers in science and religion of his day⁶. Notable were his Riddell Lectures at the University of Durham (published as *Christianity in an Age of Science*; Coulson 1953), and his John Calvin McNair Lectures at the University of Chapel Hill, North Carolina (published as *Science and Christian Belief*; Coulson 1955). Both sets of lectures develop similar angles on the vocation of the believing scientist, but the latter is by far the more substantial of the two. I therefore explore this latter text in some detail.

At the beginning of Chapter One of *Science and Christian Belief* (“The Challenge of Scientific Thinking”) Coulson states his overall aim as “to enquire about the propriety of holding Christian views at all, in an age so profoundly influenced by scientific discovery and scientific thought” (Coulson 1955, 2). One must forgive Coulson so inauspicious a start – ostensibly a run-of-the-mill apologetic defence of Christianity against scientific dominance – because his book soon turns into something much more exciting: a theology of scientific practice, built upon the personal and vocational convictions of the believing scientist. “Science itself must be a religious activity,” he claims repeatedly (30–31, 64–65, 82–83). Notice the imperative in Coulson’s strapline: “science *must be* a religious activity” (emphasis mine). The believing scientist finds it inevitable, not optional, that she is caught up in worship, devotion and theological reflection on her scientific work. Coulson’s strapline has been largely forgotten today, but its substance is still borne out in the testimonies of believing scientists such as Francis Collins (“science can be a form of worship,” Collins 2007, 230) and Jennifer Wiseman (“Science as an instrument of worship ... [It] can show us the nature of God,” Wiseman 2019)⁷. And of course, Coulson’s faithful and intimate portrayal of the believing scientist stands as a foil to the message of the *After* volume, with its more pessimistic and distanced take on the prospects for religious and moral engagement with the modern sciences.

What is perhaps better known today about Coulson’s book is that his first chapter contains an early recognition of the ‘God of the gaps’ problem. Coulson describes three apologetic stances which Christians commonly (but mistakenly, Coulson thinks) adopt when reacting against scientific challenges. First, these Christians cling to the past: They are unable to “face the implications of new knowledge, and insist on some sort of nostalgic return to things as they were. It is an attitude born of fear” (Coulson 1955, 14). Such

6 Useful biographical overviews of Coulson’s scientific career, and his evolving thought in science and religion, are provided by Leegwater 2009 and McGrath 2016.

7 More examples can be found in Berry 2009.

was the attitude, Coulson explains, of Samuel Wilberforce in opposing Darwin, or of Martin Luther in opposing Copernicus. Second, Christians often take refuge in metaphysics, using theological and metaphysical arguments to tell science how its theories should be interpreted. An example is where believers interpret Big Bang theory so that it must be in accord with the Christian doctrine of creation (18–19). And third, such Christians parcel up knowledge and experience so that science controls one part and religion the other, asserting that they can “plant some sort of hedge in the country of the mind to mark the boundary where a transfer of authority takes place” (19). If it were to be the case that there was never a scientist who is also a Christian then perhaps such a hard distinction between systems of epistemic authority might be understandable, counters Coulson, but such a dichotomy is quite impossible when we are talking of one and the same human being. Also, this mistake leads us to call upon a ‘God of the gaps’ to explain those areas of experience where science is currently silent. These gaps have a habit of shrinking, Coulson tells us (20). Finally, such Christians often use this territorial account as a “proof” of the rightness of religion: If science has boundaries, then religion must legitimately exist to cover the areas beyond those boundaries. But this way of thinking is fatally flawed if God is to be known anywhere, argues Coulson: “Either God is in the whole of Nature, with no gaps, or He’s not there at all... God must be found within the known, and not the unknown” (22). The implication is that God must be known everywhere in the sciences, a stunning conclusion which the three apologetic stances fail to grasp; the rest of the book sets out to demonstrate its validity and implications.

Straightaway the question arises of how the scientist knows that God is at work everywhere in her discipline, since God appears to be excluded methodologically from scientific enquiry. Indeed, the *After* volume hints that methodological naturalism might be problematic on this score, suggesting that it is in tension with traditional natural philosophy and with religious formation (Harrison 2022, 323). Coulson has no truck with such an anxiety. Of course God is not absent from science, however its methodology may be read. To do science as a Christian is to commit to an act of faith, to believe that truth is one – whether scientific or religious – and that therefore ‘science is a religious activity.’ Such is the subject of Chapter Two (“Scientific Method”), which seeks to establish God’s place in scientific practice. In reaction to the faulty stances of the Christian apologists laid out in the previous chapter, Coulson now proposes that, “We must seek some alternative mode of thought, and it must be one that will do justice to the splendour, the power, and the dynamic and progressive character of science” (Coulson

1955, 30). He wants to argue that the scientist's faith is by no means a hindrance to her science. The scientist should not dilute her faith nor set it to one side whilst she is at work. On the contrary, the scientist should be able to celebrate her science as science because her Christian faith brings the theological depths of her science to light. Coulson explains this with one of the most glorious rhetorical flourishes in the whole book:

There seems to be only one way out of our dilemma [whereby science seems to have made God obsolete]. If we cannot bring God in at the end of science, He must be there at the very start, and right through it. We have done wrong to set up any sharp antithesis between science and religion. Science itself must be a religious activity... [S]cience is one aspect of God's presence, and scientists therefore part of the company of His heralds... I want to be able to look at science, its methods, its presuppositions, its basis, its splendid successes and its austere discipline; and then I want to be able to say: Here is God revealing Himself for those with eyes to see (30).

Coulson seems to be telling us that we are going about our science and our theology in entirely the wrong way if we seek to discuss their relationship after the event, after the science is already done. God is there at the beginning of the scientific experiment, just as God is at its end. The divine presence is revealed as much in the assembling of the experimental apparatus, and in the first hesitant attempts at calculation, as in the final glorious theory.

In such a way, "science itself must be a religious activity," Coulson insists – at least for those with eyes to see – otherwise the scientist-believer would suffer from "an unbearable dichotomy of experience" (31). Much of the rest of the chapter is taken up with establishing this claim. He starts by addressing two sets of questions: first, "What is science trying to do? What does it mean by truth," and second, "What presuppositions, or attitudes, are involved in the practice of science as we know it in the West?" (31).

The first set of questions is answered relatively easily: The scientist is "striving continually to find a pattern of relationships that will 'make sense,'" a pattern that is able to explain both existing experiences and new observations (35). The discovery of such a coherent and universal pattern, whether it is a scientific law, principle, regularity or symmetry relation, constitutes "truth" in science (36). But such patterns are not discerned by rote, Coulson notes; science relies on the same human capacities of intuition and imagination as the arts. In such a way scientific research becomes "an adventure of the mind, in which beauty, elegance and thrill link it to wider [human] experience" (49–50). Not only must the scientist reflect imaginatively on the aesthetics of her work, but she must also exercise personal qualities of judgement, humility and passion. These qualities are essential to her ability

to function as a scientist (54–55)⁸. In this way, Coulson applies his answer to the first question (on scientific truth) to his second (on scientific presuppositions and attitudes). Presuppositions are everywhere in science, learnt from “some earlier metaphysic” (57) which has long since been forgotten by modern scientific practitioners. Here we are in “the realm of religion,” insists Coulson:

For that common search for a common truth; that unexamined belief that facts are correlative, i.e. stand in relation to one another and cohere in a scheme; that unprovable assumption that there is an ‘order and constancy in Nature,’ without which the patient effort of the scientist would be only so much incoherent babbling and his publication of it in a scientific journal for all to read pure hypocrisy; all of it is a legacy from religious conviction (57).

Coulson is here reflecting on the idea often referred to in philosophical circles as ‘the uniformity of nature,’⁹ the idea that nature is everywhere regulated by coherent patterns of behaviour (causation), from which scientists infer universal laws of nature. Coulson does not mention David Hume’s celebrated philosophy of induction¹⁰, but his (Coulson’s) point is consistent with Hume: Without that initial assumption of uniformity, scientific work could only ever be “incoherent babbling... pure hypocrisy” (57). Coulson’s further point (which goes beyond Hume) is that belief in uniformity is a legacy of religion:

[S]cience is only possible in a community where certain religious views are widely held... [O]n the basis both of its actions and its search for truth, and of its mode of working and its presuppositions, science must be described as an essentially religious activity. However little its followers may recognize this, it is still true that science is ‘helping to put a face on God’; it is one of the ways in which He is revealed (61–62).

Without modern Western culture’s background beliefs in the uniformity, parsimony and intelligibility of nature – all of which flow from the Christian doctrine of creation – science could not be possible, thinks Coulson. For that reason, if no other, “science must be described as an essentially religious activity” (62). But there is more.

8 Coulson’s brief discussion of scientific presuppositions is highly reminiscent of Michael Polanyi’s philosophy of scientific practice in *Personal Knowledge* (Polanyi 1962). Coulson is evidently influenced by Polanyi at this point, since he quotes the beginning of Polanyi’s earlier Riddell Lectures (Polanyi 1946; Coulson 1955, 54).

9 Or what Coulson calls the “order and constancy of Nature,” as referred to in “our prayer book” (Coulson 1955, 64).

10 We learn from Hume that uniformity cannot be established by empirical means, since one must assume uniformity even to test it.

In Chapter Three (“The Human Element”) Coulson takes the theological basis of scientific practice further by expanding on the personal dimension of science. In order that science may aspire to truth, its presuppositions – which, as he has pointed out are religious in origin – must be a “mode of God’s revelation”:

The experiences on which science is based are not just random events. They are related to each other, and are ultimately held together, by the fact that they are God’s revelation. I want to say of them that every experience is an encounter – an encounter with some reality to which we can give no other name but God (65).

Science is a human enterprise which presupposes that truth arises from the scientist’s personal encounters with a coherent and universal reality, but this presupposition flows from the revelatory nature of such encounters: revelatory of the immanent God. Coulson recognises the obvious question that arises: “If it is really true, as I have claimed, that science is a religious activity, why do not all scientists recognize this? Why are they not all professing Christians?” (64–65).

Coulson addresses this question throughout the chapter. Ultimately, he believes that reality is mediated to us in “alternative representations... in terms of different frames of description” (66). Humans do not all see reality *in toto*, and neither do they see the same view of reality, but, of all humans, Christians take *every* view into account in reconstructing the most complete account of reality. This reconstruction is a fundamentally religious activity.

Coulson explains with an analogy. Take the architectural plan of a building. The plan presents different drawings (different views, projections or elevations) of the building from different angles. Each drawing is a two-dimensional representation of the building’s three-dimensional reality; there are many drawings but only one building. Each drawing is ‘true’ in that it is essential for constructing the building – and the architect is able to discern each drawing’s truth as such – but to the untrained eye the drawings may appear quite incompatible. The analogy is “quite obvious,” says Coulson (67): The building stands for the reality God, but there are many different experiences and descriptions of that same reality. Effectively these different experiences and descriptions stand for the different academic disciplines, whether of the various sciences, arts, or humanities. Each is an authentic revelation of God, even though they are not all the same (67–68).

After many such analogies exploring complementary descriptions of a single reality, Coulson gets back to God. Why does the astronomer with her telescope or the physiologist with her microscope not always recognise God

in her work? The answer is clear: “The resolution of the paradox lies in the recognition that although science may be a religious activity, it is not a religion” (83). And here he must define religion, which he takes to be “the total response of man to all his environment” (83). By total response, he means the person’s “whole being, his body, his mind, his concepts, his emotions, his imagination, his human relationships, everything that can be said about him in terms of the wholeness of his being, which is distinct from his environment” (83)¹¹. Just as the architect is able to visualise the building by ‘seeing’ the total assembly of drawings as true, so the religious believer is able to build up a full picture of God by reflecting on her “total response” to her environment. Thus the “act of reflection” leads the believer from study of the created works to contemplation of the Creator (84).

Coulson’s “act of reflection” is central to his claim that science is a religious activity. This act is what makes the difference between a believing and a non-believing (i.e. non-religious) scientist: “When a scientist asserts that he is not religious, we shall want to say of him that he has not, or cannot, make the full act of reflection. His response to his environment may be generous, but it is not ‘total’” (86). Take, for instance, various scientific accounts of the human being:

The physicist will describe [the human] as a machine for doing work, the chemist as a means of converting chemical energy into other forms of energy, the biologist will speak of him as the latest – and perhaps the last – product of the evolutionary process. All three pictures – and of course there are more than these three – arise from one or other of the grand conceptual schemes of science, and they reflect the religious character of all true study as we have described it before. But the Christian, making his act of reflection and his total response to this almost bewilderingly rich variety of pattern, will want to say: he is a child of God. But we must be careful. The physicist, as such, gives only one of these answers, the chemist and biologist only one. The Christian gives them all (95).

Each science provides only a partial answer, but the Christian has a ‘total’ view of science in its environment by virtue of her personal religious faith, her own inner recognition of the revelation of God in every partial view. She therefore perceives that her science is a religious activity. In contrast, the unbelieving scientist has only a partial view and no such perception.

¹¹ It is worth noting that Coulson’s understanding of religion here is similar to the pre-modern understanding of *religio*. Unlike our modern term ‘religion,’ which usually refers to a system of propositional beliefs and practices which are distinct from those of other ‘religions,’ *religio* tended to refer to a person’s inner dispositions and virtues (Harrison 2015, 7–8).

Mindful that he has said very little so far about the specifically *Christian* basis to his understanding of science, Coulson expands on the personal and revelatory dimensions of the scientist's act of reflection in the final chapter – Chapter Four (“Christian Belief”) – arguing that it is those dimensions which make science so very *Christian* in its nature. We must begin with the measurements, observations, and experiences of science, he says, for so we will see that the act of reflection leads us from Natural Theology to Christian belief (Coulson 1955, 98). Accordingly, the first thing we notice about the measurements and experiences of science is their “given-ness” (98):

So it seems as if the inner truths of our concepts and our brilliant imagination are really not our own at all: they are something which we could not find for ourselves, unless it were given to us in the search... [I]n every encounter with reality, in whatever discipline, we find that the reality comes to meet us; it is given (99).

Even the empirical truths of our science are a gift to us, they are revelatory. But revelatory of what? We need to consider a second point, Coulson says: The unity of these truths, made possible by the scientist's act of reflection on her observations:

The second thing to say about the act of reflection is that the separate patterns, or disciplines, on which it rests, express a unity... It is one of the deepest convictions of scientists that, ultimately, their science is one. This is true at all levels – within one science; as between one science and another; and in regard to the relation between man and nature (99).

As Coulson pointed out earlier, there is only one building despite the many drawings of it. But this conviction of the unity of truth cannot be made on the grounds of any one science, nor even of science as a whole; it is fundamentally a *spiritual* conviction, which is Coulson's third point: “Not only do our separate disciplines reveal a unity; but that unity has a quality about it which can only be described as spiritual... Nature itself acquires a spiritual significance” (101).

Coulson summarises these three points in what is perhaps his most remarkably theological statement about science so far:

If my argument is sound, then the ‘reality of God’ affects every issue, since whatever we see, wherever we look, whether we recognize it as true or not, we cannot touch or handle the things of earth and not, in that very moment, be confronted with the sacraments of heaven (102).

Science is not only a religious activity, it is a *sacramental* activity. Coulson does not elaborate further, but I cannot resist drawing upon an obvious example. Just as the Christian sees the bread and wine of the altar, and per-

ceives the signs of Christ's body and blood through her act of reflection, so it is with science.

But we are still not quite at Christianity. Coulson's next step is to emphasise "the spiritual quality of the unity we experience" (103), since this must be expressed in *personal* terms: "[S]cience only exists because there are people, and the whole of its working is bound up with persons. Man and Nature have been bound together in an inescapable intimacy. No account of Nature can be given other than in personal terms" (103). And if this personal encounter of "inescapable intimacy" between human and nature is also spiritual and revelatory, then we are led to the divine originator of Nature:

This is the place at which the specifically Christian element is most naturally introduced. If it be true that truth can only be expressed in personal terms, and if it be true that all partial truths have a link which binds them together in the response of persons to God as He is revealed in the panorama of their environment, then it is not unreasonable to suppose that the whole process may be gathered up in one person – a representative person, an archetype – in whom the truths of nature and the truths of people find their meaning (112).

The act of reflection by persons – an intensely personal experience on a personal reality – leads to *the one person* who gathers it all up in himself (i.e. Christ). As scientists, we may speak of impersonal and universal laws of nature, but we only ever experience those laws in our particular, individual and personal circumstances. And so it is correct to believe that the universe is incarnate in a representative individual (Christ), and that our own individual observation of a general law of nature in action – say, of a particular stone falling under the law of gravity – is interpreted by Christ who provides the personal meaning for all generalities (112–13).

Presumably aware that he has entered a somewhat mystical stage in his argument – a stage that non-Christian scientists are unlikely to follow – Coulson ends the book shortly thereafter, largely by recapitulating the logic of the previous chapters. The personal nature of science is paramount, as is the sacramental quality of what science reveals about nature in every observation, sacramental truths we could never know without science. By holding these convictions together in our personal act of reflection we realise that science is a religious activity.

Coulson draws to a close with a characteristic rhetorical flourish: "All life is sacramental; all nature is needed that Christ should be understood: Christ is needed that all nature should be seen as holy; that amid all its turbulence and tumult God's perfection might grow; and our hearts be filled with wonder at the significance of the least of all this work" (118). To the scientist-theologian, all of life is sacramental. Why, therefore, should

science not be equally revealing of the divine presence, if only one has the eyes to see?

4. Discussion

I have explored Coulson's book at length and in a largely descriptive mode, partly because it is so little-known today, and partly because his argument (that science must be a religious activity) is a perfect exemplification of the scientist-theologian's confession. My critical contribution is therefore to insist on the relevance of *confession* – and on Coulson's particular mode of confession – to the dilemma posed by the *After* volume. To be precise, I suggest that the positive and intimate theological relationship with the sciences exemplified by Coulson (but also by other scientist-theologians) offers a critical foil to the distanced caution which dominates the *After* volume.

But we can take Coulson's act of reflection further, especially his point that God must be everywhere in science, or else God is nowhere. Scientific research is thoroughly theistic to the scientist who perceives according to Coulson's "total response." All of Coulson's scientific work – all of my own scientific work – must be religious activity. When I fail to see my theism reflected in my science at every turn, I fail to see the sacraments of heaven; my view is partial.

I suggest that this partial view crops up in the "After" project, most clearly among those commentators who argue that scientism is inescapable in science, that dialogue between science and theology is really a one-way monologue, or that scientific method presents theological reasons for caution. Following Coulson's lead, I suggest that science is not lacking in theological depth of its own, because science is already thoroughly religious to the believing scientist, who is impelled to take a theological view of her work¹².

More generally, insofar as the "After" project presents the modern sciences as a *problem* for theology, I suggest that the project appears to espouse that third error singled out by Coulson, of planting "some sort of hedge in the

12 Note also that there is an historical argument to make here regarding the theistic underpinnings of the sciences. Coulson hints at such an argument. The point is that the modern sciences are so effective precisely because their assumptions are grounded implicitly in natural theology (e.g. regarding the universal and unchanging laws of nature, and nature's fundamental parsimony and intelligibility). Crucially, these presuppositions were defended on theological grounds in early modern times by figures such as Galileo and Newton. Modern scientists do not, by and large, reflect on the genesis of these presuppositions, but that does not make them any less theological at root in the present time.

country of the mind” between scientific and religious authority (Coulson 1955, 19). For sure, there are many individual scientists today who are religious sceptics, and there are many scientific research projects today which present theological challenges. But to construe the modern sciences as a problematic block *en masse* is not only to edge towards essentialism (again), but to miss Coulson’s point that science must be a religious activity for those who have the eyes to see. Indeed, I would go further than Coulson and suggest that learning the rigours of a scientific discipline at first hand is not only *like* a spiritual/religious discipline – perfecting qualities of patience, focus, and determination – it actually *is* a spiritual discipline, where the “sacraments of heaven” are made manifest through scientific trial and error in present times, and all without needing to retrieve the natural philosophy of past times. The believing scientist’s act of reflection makes all the difference.

One final point, in relation to the “After” project and its misgivings on ‘dialogue’ as a realistic mode of interaction between science and theology/religion. Coulson’s theological musings on the vocation of the believing scientist are often brief and allusive. It is a short book, after all. Dialogue with professional theologians could sharpen Coulson’s suggestions considerably, showing where some lines could be developed further, where others need careful unpacking, and where others are problematic and should be abandoned. Such dialogue would obviously be two-way. My point is that, just as Hefner suggested that dialogue between professional theologians and scientist-theologians is a genuine form of two-way dialogue between the disciplines of science and theology, so further theological reflection on work such as Coulson’s by theologians and scientist-theologians would be a positive way of further exploring ‘dialogue’ as a mode of science-religion discourse.

All this is not to overlook the various stages in Coulson’s argument that can be critiqued, especially his Christology. Since Coulson conceives of Christ from the starting point of human scientific observations rather than the divine initiative his development is vulnerable to the same question as that faced by all ‘from below’ Christologies, namely whether such a scheme can span successfully from the finite to the infinite. At any rate, it is telling that Christ only appears explicitly in the argument when Coulson invokes the scientist-believer’s pre-existing Christian faith (112–13). But Coulson’s move at this point also makes it apparent that this last part of the book is utterly confessional. Indeed, if Hefner’s analysis of Polkinghorne’s work as ‘confession’ is to be believed, then all of Coulson’s theology of scientific practice is to be regarded, similarly, as confession. While Coulson initially states his aim in the book as a general-purpose Christian apologetics in the face of scientific modernism, it quickly becomes clear that he is more interested

in explicating the personal motivations of the working scientist-theologian, or Coulson's own motivations in other words. Coulson's book is confession through-and-through, and confession of an undeniably high intellectual quality, informed by a wide range of scientific, theological and philosophical sources. Indeed, we could also label the book an 'act of reflection' in its own right, which, in Coulson's hands, is clearly another name for 'confession.'

Act of reflection or confession, throughout his book Coulson demonstrates how he integrates his modern scientific research interests with theological enquiry at an intimate and personal level. I therefore suggest that Coulson's act of reflection as a scientist-theologian is a highly effective counterexample to the "After" project's distanced view of the modern sciences.

5. Conclusion

My point throughout has been to suggest that there are historical resources to answer the questions posed for science-religion discourse by the *After* volume, resources that stem from the early decades of our discourse when it was dominated by scientist-theologians like Charles Coulson and John Polkinghorne. Often, these figures were motivated by apologetic concerns – hence the aptness of 'confession' as a generic title for their work – but the theological richness of their close and personal reflections on scientific practice transcend the requirements of mere defence. Unfortunately, some of their most potent wisdom has been forgotten today; quite simply, the science-and-religion area has evolved into many new areas, and finds less need to call upon religious apology. Hence, this article has attempted to recover and re-package some of the wisdom of the early decades of our discipline. My suggestion is, therefore, that the *present* phase of the science-and-religion area has the resources to support robust theological engagement with the sciences, and that it is too early to be speaking of an "After" phase just yet.

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