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## NOTES ON CONTRIBUTORS

**Adrian Brown** has taught Physics, Religious Studies and Philosophy in Secondary Schools. He has co-written and edited many of the standard texts on Science and Religion for pre-university students. Recent publications include an ebook, *The Big Bang and the Interfaces of Knowledge*, and an exercise in ecotheology entitled *Education: Changing the Climate*.

**Allan Chapman** is a historian of science at Oxford University, specialising in the history of astronomy and of medicine. He is also particularly concerned with the historical interaction between Western science and the Judaeo-Christian faith.

**Philip Chapman** is a Methodist minister. His original studies were in chemistry with a smattering of quantum mechanics and lectures from Paul Feyerabend on the philosophy of science. He served in several countries. In 2013 he completed his PhD thesis entitled 'The Late Modern Body and Soul: Charles Darwin and Karl Barth'.

**Louise Hickman** is editor of *Reviews in Science and Religion*. She is Senior Lecturer at Newman University and has written on the history of philosophy and philosophy of religion, including her monograph *Eighteenth Century Dissent and Cambridge Platonism: Reconceiving the Philosophy of Religion* (Routledge, 2017).

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**Philippa Taylor** is Head of Public Policy at the Christian Medical Fellowship. She has an MA in Bioethics and law and is also a consultant to CARE on bioethics and the family.

**Frederick Toates** is Emeritus Professor of Biological Psychology at the Open University, where he has spent the last 40 years. His research is in the area of the brain's control of behaviour. He lives in Milton Keynes and still teaches students of the Open University, and Universities of Amsterdam, Northampton and Bedfordshire.

## EDITORIAL

As I write this editorial in the unremitting summer sunshine, the sheer speed of scientific advancement on so many different fronts gives pause for thought. A quick glance at *New Scientist*, for example, leads only to amazement at everything from artificial intelligence able to spot the best grapes for pesticide-free wine to bio-engineered laboratory-made lungs.

Several recent stories report various developments in psychology in relation to trauma, including how to 'hack' into your unconscious to conquer fear, and about the long lasting detrimental effects on children who have been separated from parents at the US border. The subject of childhood trauma and of how neuroscience, or neuropsychology, can inform our approach to mental health is the focus of this edition's article contributed by Suzanne Hyde, which is based on a talk given at the SRF conference last year. Hyde shows us how important the first years of life are for mental health and in showing how a good environment is essential she challenges genetic reductionism. She is interested in the question of why it is we sometimes do what we don't want to do and at other times don't do what we think is right: a question central to theologians and psychologists alike. In this article she argues that neuropsychology can help us understand what is going on here and also that we can change and heal: we are not just victims of what happens to us. She makes an important case for the role of metaphor and religious rituals while pointing to how neuroscience and religion might be brought together in the treatment of trauma.

In the first of this edition's book reviews, Adrian Brown discusses Stephen Barr's *The Believing Scientist*, taking us through this collection of his writings, and his critique of materialism, naturalism, Creationism and genetic determinism.

Like Hyde, Barr resists the attempt to reduce the mind purely to explanation in terms of matter.

This is followed by Philip Chapman's review of Simon Oliver's *Creation: A Guide for the Perplexed*, which discusses the theology of creation and its relation to grace, the meaning of work and the idea of gift together with the implications of these things for economics and human relationality. Russell Stannard's *The Divine Imprint* is reviewed by Frederick Toates who engages rigorously with Stannard's philosophy of mind. The subtitle 'finding God in the Human Mind' points to Stannard's interest in psychology. The mystery of consciousness is a matter of faith rather than science and, for Stannard, it is characterised by properties that we would not expect if it was merely a mechanistic survival machine produced by evolution. In the last of this edition's original reviews, I have contributed a discussion of Roger Trigg's latest book, *Does Science Undermine Faith?* Trigg's answer is a definitive 'no'. He shows, on the contrary, what faith can contribute to science, if it is to avoid subjectivism.

There are two reviews produced from elsewhere. The first is by Philippa Taylor who reviews Chris Willmott and Salvador Macip's *Where Science and Ethics Meet*, a helpful engagement with a range of contemporary issues in applied ethics. The second is Allan Chapman's review of H. Foris Cohen's *The Rise of Modern Science Explained*, a fascinating account of the history of scientific development. Chapman draws out several differences between his and Cohen's reading of history, highlighting some important debates about the cause of Western science's development, for example, the relative importance of chance events as opposed to intellectual developments.

I am, as ever, extremely grateful for the contributions received for this edition. As I'm sure you will appreciate they go some considerable way towards the vital work of reflecting

theologically and philosophically on some of the tremendous number of aforementioned scientific developments.

## CONFERENCE ARTICLE

### **‘When the Spirit is Silent the Body Cries Out’ (Dr Paul Tournier). What can neuroscience contribute to psychotherapy and religion?<sup>1</sup>**

SUZANNE R. HYDE

#### **Introduction**

When I was asked to speak at the SRF conference in August 2017 I hadn't quite appreciated what an enormous task I had taken on. I am a Jungian analyst, not a scientist but have long had an interest in neuroscience and the relevance of its findings for my psychotherapeutic practice. My interest was initially stimulated by a free video that Richard Bowlby, the son of the attachment theorist, John Bowlby, had produced about his father's work. In this video Richard showed clips of some of the early neuroscientific research which began to confirm the importance of strong early attachments for healthy mental and emotional development. Eighteen years later, after first watching that video, I found myself immersed in the world of neuroscience and trying to articulate its relevance to my own clinical practice. One day, I got up from my desk that was covered in books and papers, my head filled with research findings and theory, when it suddenly hit me like a lightning

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<sup>1</sup> This paper is based on a presentation at the SRF conference run in partnership with the Guild of Health and St Raphael, 31<sup>st</sup> August -2<sup>nd</sup> September 2017, Mental Wellbeing, Neuroscience and Religion at Bishop Grosseteste University, Lincoln.

bolt - this paper is really about *love*. Or perhaps to put it another way, in the words of Bessel Van Der Kolk, who has written one of the most accessible books on trauma and neuroscience—called, aptly, *The Body Keeps the score*—‘being able to feel safe with other people is probably the single most important aspect of mental health’ (Kolk, 2014: 79).

When writing this paper, I remembered the above quote from the Swiss Psychiatrist Dr Paul Tournier, that I had stumbled upon when a theology student in my early twenties and never forgotten. Although my career trajectory has taken many divergent paths, from journalism, management, coaching and finally psychotherapy, I have always nurtured an interest in the inter-relation between mind, body and Spirit. The aim of my talk, and now this short paper, is to explore, using some of the findings from neuroscience, the impact of early trauma and the consequences on a person’s mental health and well-being. But also, how these same findings can provide insight into how mental health can be re-built and restored. The last part of this paper will look at the implications of integrating our understanding of this very human trinity of mind, body and spirit, and also talk about the work at St Marylebone Healing and Counselling Centre, where I am currently Clinical Director.

But as background, I wanted to briefly return to the video on neuroscience and attachment which featured the forerunners of neuropsychology, Alan Schore and Dr Susan Greenfield, amongst others, and featured the earliest brain scans and footage to show what was going on within our neurobiology. Fascinatingly, one scientist showed footage of how neural pathways connect and made the now famous comment that neurons that *‘fire together wire together’*. He stressed the point that it is *affective*, emotional experience that causes neural pathways to be established and strengthened. The video also asserted that babies are not ‘born bad’ or



mentally ill, but alongside genetic endowments, the early environment, particularly pregnancy and the first two years of life, lay the foundations for mental health. And as psychotherapist Sue Gerhardt comments in her book *Why Love Matters*: 'This is when the social brain is shaped and when an individual's emotional style and emotional resources are established' (Gerhardt, 2015: 3).

The other key thing that I remember from the video, and I have never forgotten the image, were some early brain scans that were taken from two, two and half year-old babies. The first scan was of a baby who was in a loving and lively family – in the central area in the brain concerned with language development and relationship, was a mass of neural pathways. Chillingly, in the other scan, from a Romanian orphan, who I am sure we all remember were left with little human contact, and bottles just being pushed through the bars of their cots – there was a blank space. Whenever I showed this video to trainee counsellors, this was the point when the room became silent and often people would have tears running down their face. Doing further research for this paper, these CT images have become more sophisticated and you can see on various science websites the reality of abuse and neglect that a lack of love and care have on the baby's developing brain. If you put 'the impact of early trauma on brain development' into your internet browser you will find images showing that neglect and trauma reduce the size of the brain and the corpus callosum, an area in the centre of the brain connecting right and left hemispheres. I'll come back to this later.

This video made a huge impact on me and set me on a quest to understand how we can use what we learn from science to inform how we relate to ourselves, our traumas and to others. Psychotherapists and clinicians no longer needed to rely on anecdotal and experimental evidence to see the profound effect that parental deprivation and abuse cause on a

baby's developing brain and the subsequent problems that will ensue.

I originally trained as a Freudian psychotherapist. However, the confirmation from neuroscience of the vital importance of the early relational bonds made me question 'was there any hope or point to therapy if these patterns are so deeply hard wired?' Being an eternal optimist, I became drawn to the works of psychologist C. G. Jung because of his life-long conviction that we are not just victims of what happens to us. Jung also gave a profound place to the deep importance of Spirituality and symbols, including Christ as the ultimate symbol of healing. Jung did not have brain scans and MRI imaging to back up his conviction that we can grow, and also – crucially – recover and heal from trauma. However, neuroscience, or neuropsychology, which is the application of findings to psychology, offers information that can illuminate and challenge our approach to mental health and interventions.

So, before I launch into a tour of what neuroscience can offer to our thinking about mental health, let's briefly consider our current situation. You don't need a psychiatrist or psychotherapist to point out that we have a major mental health epidemic in this country. Recent figures show that suicide is the number one cause of death in men under 50. You can look up statistics on the internet but the key figure is that 1 in 4 people in the UK suffer from a mental health issue every year. Alongside this are a host of inflammatory diseases and illnesses that are a by-product of smoking, alcohol & drug addiction and obesity. It's overwhelming. Jung comments: 'It is often tragic to see how blatantly a man bungles his own life and the lives of others yet remains totally incapable of seeing how much the whole tragedy originates in himself, and how he continually feeds it and keeps it going' (Jung, 1954-1979: Vol. 9, Part II, p. 4014).

It is easy to read that comment, but why do we bungle it so badly, why do politicians make such crazy mistakes, sleeping with prostitutes, gambling with other people's money? Why do famous and successful artists end up dead from drug over-doses and suicide? Or more simply and personally how many of us have echoed St Paul's words in Romans 7:15, 'I do not understand what I do. For what I want to do I do not do, but what I hate I do' (NIV).

Or I like this translation better:

'I don't really understand myself, for I want to do what is right, but I don't do it. Instead, I do what I hate' (English Standard version).

Well, it turns out that neuropsychology can help us to understand ourselves and others, and harness the potential within our psyches to heal and recover and make profound changes that can alter our own lives and impact those around us.

As mentioned earlier, I am not a scientist, my area is of course the psyche, but Freud, the father of psychoanalysis who was a neurologist, commented to a colleague before his death: 'Don't just learn psychoanalysis as it exists today. It is already outdated. Your generation will bring about the synthesis between psychology and biology. You must devote yourself to that' (quoted in Servan-Schreiber, 2003: 31).

I am trying to embrace Freud's instruction, and will attempt to condense and put in layman's terms what I have discovered to be of great help from neuroscience. I must also add the caveat that what I am sharing is a fraction of the knowledge that is available and of course advances are being made all the time. Every week when I open up my copy of *New Scientist* there are many new discoveries. My aim in the following sections is to provide a quick guide to some key information.

## **The Brain**

In order for me to elucidate key learnings from neuropsychology I need to provide a few basics about the brain. I imagine most readers are probably familiar with what I am going to say, but hopefully, it might be a good refresher. Also the children's film *Inside Out* (Pixar) is a really helpful insight into the workings and development of the human mind.

### **Key information points about the brain**

The human brain has evolved over the millenia in response to environmental challenge and more latterly in response to the development of language. It is shaped by inherited pre-dispositions but also by the environment and crucially, as already mentioned, the relationship with the baby's primary care givers. It is common knowledge now that we have two brain systems/structures. Our deep structures are identical to those of apes and form the primitive brain, the one we share with all mammals. In the deepest part of this brain is our reptilian brain, these structures are called the limbic brain and they are responsible for emotion and the body's physiology. This system is often referred to colloquially as our animal brain, or our 'chimp' brain. This limbic system is the seat of our emotions and monitors danger, pleasure or pain. It regulates our breathing, blood pressure, appetite, sleep and sexual drives, hormones and even the immune system follows it orders. Its goal is survival by trying to keep everything together. When sensory information comes to us (or the baby) through our eyes, nose, ears, skin and touch—i.e. taste, cold, pain—all these experiences meet in the thalamus in the limbic system. Think of it as '*ooh what's all this about?*' Depending on the sensations they can either spark alarm (pain, hunger, thirst, threat) and therefore set off an internal smoke alarm which

releases powerful hormones (cortisol and adrenaline) which enable us to fight, run away, or freeze. Once the danger is past the body can return to its normal state. If the feeling is good, for example, when someone is kind to us, this feels good, and creates positive neural pathways; the neurons that fire together, wire together effect.

The second brain is a much younger brain (in evolutionary terms), called the neo-cortex, which means new bark and is the envelope structure we see on brain scans. The neo-cortex is only developed in humans and is our information processing centre. This brain system is concerned with the world outside, goal setting, time and action. Right above the eyes is an area called the 'pre-frontal' cortex. With healthy development, this system is particularly well developed, although as we saw earlier its growth can be inhibited due to early neglect. This part of the brain is responsible for attention, concentration and the inhibition of impulses and instincts and social behaviour and morality. It can also recognise sounds (studies show that the baby can recognise its mother's voice from the womb).

For the sake of this paper I am going to call these two systems, the rational brain (neo-cortex) and the emotional brain (limbic brain). People often talk about them as the right and left brain—and locate the emotional brain predominantly in the right and the rational in the left—although they can merge and overlap.

The right hemisphere (emotional brain) is more mature at birth than the left and processes the baby's earliest response to stimuli, face and emotional experiences and regulation. The left hemisphere (rational) deals more with linguistic and analytic ability. In between the right and left brains is the corpus callosum, which is the major highway between the two hemispheres. Crucially research has shown that trauma and fear inhibit speech and reduces the width and depth of this highway, narrowing it, which has implications for a person's

ability to function in a healthy way. In the MRI brain scans, in the Romanian orphan's brain this highway was much narrower and smaller.

Dr Seran-Schreiber a psychiatrist and a neurologist describes life as the constant challenge to balance both brains. Our two brains can either co-operate with each other or compete. Schreiber comments that the emotional brain directs us towards the experiences that we seek (usually need satisfaction; hunger, sex and comfort), and the rational brain tries to get us there as intelligently as possible, considering the potential risks and consequences of acting on our desires (Servan-Schreiber, page 36-37). When the emotional and rational brain work well together it results in an optimum state where we are likely to be mentally well and this is repeatedly shown in brain studies.

However, I now want to address 'what goes wrong?' Darwin pointed out that the fundamental purpose of emotion is to initiate movement that will restore the organism to safety and physical equilibrium. However, in mental illness this biological survival system seems to get powerfully over-ridden. Instead of the two brains working together to ensure safety and health, people often put themselves in dangerous situations, repeat destructive behaviours and use drugs, alcohol and food as attempts to self-medicate with often disastrous consequences and the development of deeply damaging addictions and increased suffering.

There are many reasons for mental disorders – genetic pre-dispositions, physical conditions, poverty, war zones, poor nutrition, and the list could go on. However, I want to now focus on the impact of early trauma and how findings from neuroscience can identify why it leads to enduring mental and physical health problems. But also how we can equally use this understanding to bring hope and healing to those afflicted and indeed to the wounded parts of ourselves.

## Trauma

When a baby is born (and indeed even pre-natally) he or she cannot control its environment, hence their intense vulnerability and dependence on their care givers. With regard to brain development there are windows of time in the development of the infant and the adolescent where crucial growth and development take place. The primitive brain that we are born with basically ensures that the organism works and survives. The pre-frontal cortex (the rational brain) develops almost entirely post-natally and doesn't begin to mature until toddlerhood. It also (as we have seen from brain scans) does not develop automatically. But as Gerdhart comments: 'the kind of brain that each baby develops is the brain that comes out of his or her particular experiences with people. The orbito-frontal cortex connects up through social stimulation, play, and touch. The cognitive system is dependent on the quality of the earliest care-giving experience' (Gerdhart, 2015: 55).

Neuroscientist Daniel Siegel comments, 'it is the human connections which shape the neural connection from which mind emerges' (quoted in Wilkinson, 2006: 8). Neuropsychologist Alan Schore comments that the limbic system (i.e the emotional brain) develops in the first 18 months as the right hemisphere is in a growth spurt before the left hemisphere has really come on line. He suggests from this then that: 'attachment experiences *inevitably* affect the limbic and cortical areas of the developing right hemisphere. It becomes part of the implicit memory and leads to enduring structural changes that produce inefficient stress coping mechanisms' (quoted in Wilkinson 2006: 40).

By ten months the pre-frontal cortex matures and enables the baby to start making sense of its feeling experience i.e. to integrate its emotional experience. Neuroimaging studies of human beings in highly emotional states demonstrate that

intense emotions of fear, sadness and anger all activate the emotional brain and that the rational brain goes off line. When this happens we say of people that they have 'taken leave of their senses'. We also see this with war veterans who many years later at the sound of a car back firing, hit the ground, even though they rationally know that they are not in a war zone. Or to put it another way when the emotional brain feels that something is a matter of life or death, the pathways between the frontal lobes (rational brain) and the limbic system (emotional brain) become very tenuous. For a young baby parental neglect, sustained trauma or abuse means that their emotional brain is continuously in fight or flight or freeze mode. Also constructive relationships between the emotional and rational brain are often not established (corpus callosum). As the baby's system is in survival mode the development of the rational brain is inhibited. In times of deep stress or distress, the part of our brain, the thalamus which collects sensations and helps to make sense of them, breaks down, so that the trauma cannot be remembered as a story- i.e. with a narrative with an end and a beginning. Instead the experience becomes fragmented and is experienced—or often re-experienced—as sensory imprints, images, sounds and smells, often accompanied by emotions of terror and helplessness. Often the person freezes, develops tunnel vision or hyper-focus, and when people are asked about the event, they can usually only remember fragments. The rational brain is responsible for context and meaning and how our present experience relates to the past and how it may affect the future. This helps us to develop a sense of context and we can re-assure ourselves in times of stress that this is 'finite'. In trauma, because the rational brain is inhibited, the person cannot process the event, and is left with the experience of a 'never-ending trauma'. Gerhardt confirms this when she says:



'stressful early relationships also make it more difficult to establish important neural pathways between the amygdala (internal sensor) and the prefrontal cortex. When those connections are weak, the pre-frontal cortex cannot do a good job of holding back the amygdala's fearful responses or of correcting earlier fear conditioning' (Gerdhart, 2015: 56).

This, she suggests, means that as a baby grows they are more prone to depression and anxiety because the emotional brain over-powers or floods the rational brain. This occurs because the amygdala – the internal sensor – can go into overdrive because it is over-sensitised. This releases stress hormones, elevates blood pressure and can cause sweating and trembling. These are all vital survival responses if you are in an accident or a war zone, but in every-day life it can cause a continuous sense of anxiety, fear and stress. A person will have enormous difficulty in healthily regulating emotions. Trauma also increases therefore the risk of misinterpreting whether a particular situation is dangerous or safe. A person can then develop a faulty alarm system which is over-sensitised, i.e. over-reacts or in more extreme cases, through dissociation is de-activated and therefore the person puts themselves in danger. If you were living in this type of body with this cacophony of chemicals and impulses, with little ability for your rational brain to make any impact, I imagine alcohol, drugs or dissociation would be a very appealing option. As Van der Kolk movingly comments: 'if you feel safe and loved, your brain becomes specialised in exploring play and co-operation, if you are frightened and unwanted it specialises in managing feelings of fear and abandonment' (Van der Kolk, 2014: 56).

Very often psychologists try to use insight and understanding to help people manage their behaviour. However, neuroscience research shows us that very few

psychological problems are the result of defects in cognitive understanding. We all know of people who can tell you in great depth and with great articulateness about their problems, and may have had years of therapy. What we now know is that pre-dominantly, mental health problems originate in pressures from deeper regions in the brain that unconsciously drive our perception and attention. Our baby self (emotional brain) feels that the world is not safe, that people are frightening, that we need to be on red alert all the time. As Der Kolk comments: 'when the alarm bell of the emotional brain keeps signalling that you are in danger, no amount of insight will silence it' (Van der Kolk, 2014: 64).

### **Implications & Observations**

In Van der Kolk's book he describes that when people who have been traumatised are asked to recall the trauma whilst they are in a scanner, only the right side of the brain lit up, meaning that the person's capacity to integrate and make sense of their experience is not on line; they are not able to *think* about their experience, only re-experience it traumatically. Much of psychotherapy and healing has been about allowing the person to tell their story and of course there is great therapeutic value in being heard and seen, and people's experiences being validated. However, what has been confusing is why this in itself hasn't necessarily been the cure for neurosis (or psychosis) that the founding psychoanalytic fathers envisaged. In this brief tour of some elements of neuropsychology, we are beginning to understand why. People with early trauma or neglect have very poorly developed pathways between the right and left side of their brain. In order to deal with life and stress and any difficult situations it is crucial for human beings to be able to utilise both brains; the emotional brain picks up threats, and the rational brain interprets and makes sense of those threats. The rational brain

can also help us to temper emotions and keep them in check. The left brain also can think about consequences; maybe having a liaison with my staff member is not such a bright idea, particularly if I am married and President of the United States! Der Kolk comments: 'our self-experience is the product of the balance between our rational and our emotional brain. When these two systems are in balance we feel like ourself. However, when our survival is at stake, these systems can function relatively independently' (Kolk: 2014: 4).

Well I promised you some good news from neuroscience too! Although the first two years of life, (and there is also a window in adolescence when the brain is more malleable to change due to the hormonal changes) means that our brains and personality are pretty much set. However, neuroscience has also demonstrated the plasticity of the brain. Which means that we can create *new* neural pathways in the brain and of course neural pathways can also wither from non-use; the 'use it or lose it principle'. This was the most exciting finding for me from neuroscience and made sense of the comment that many people would make to me about their therapy. When reviewing our work, they would rarely comment upon insights gained, but would refer to some moment in our work when they felt that I genuinely loved them or showed myself as human i.e. by making a mistake. This was a turning point for them; they felt loved by another human being. We know from neuroscience that when we experience an 'affect' – whether positive or negative – it fires neuron development and repeated firing creates neural pathways. When I am present to my patients in a consistently, emotionally engaged way it helps them to develop new neural pathways. Also, there have been some promising studies that when adopted Romanian orphans have access to intensive therapy alongside the love from their new parents, there is more hope for growth in the pre-frontal cortex. Sadly, many people who adopted Romanian

orphans found that they could not cope with their inability to relate or show any affect, as they were so 'cut off'.

Der Kolk confirms this situation when he advises: 'people can learn to control and change their behaviour, but only if they feel safe enough to experiment with new solutions. The body keeps the score: if trauma is encoded in heart-breaking and gut-wrenching sensations, then our first priority is to help people move out of fight-or-fright states' (Kolk, 2014: 349). He means by this that we have to help their nervous systems to calm down – or in the case of somebody who is dissociated, to help gradually bring their emotional brain back on line.

### **How do we do this?**

In his fascinating book, *Waking the Tiger*, Peter Levine shares a ground-breaking therapy which asked the question, if trauma is stored in our 'animal brain' why do animals in the wild, though threatened, chased and harassed, rarely show signs of trauma. He, along the lines of many neuropsychologists state that, 'the key to healing traumatic symptoms in humans is our physiology' (Levine, 1997: 17). Through his psychotherapeutic work he focuses on integrating the physiological affects when people are relating a traumatic event, whilst keep the rational brain on line. Also treatments like EMDR (eye-movement de-sensitisation regulation) again use the body and mind together. Der Kolk has a clinic in Boston where they offer a range of treatments, EMDR, cognitive behaviour therapy and psychotherapy. He also has a yoga studio next to the clinic, where people are encouraged to begin to connect with their body, which they have perhaps long been dissociated from. Der Kolk comments: 'traumatised people need to learn that they can tolerate their sensations, befriend their inner experience and cultivate new action patterns' (Kolk, 2014: 273).

The book mentioned earlier, and that I often recommend to my own patients, *Healing without Freud or Prozac* considers how the emotional and rational brain can learn to get along. Servan-Schreiber suggests seven natural treatment approaches, which include: yoga or exercise, mindfulness/meditation, omega 3 fish oils, being involved with a community, acupuncture, EMDR, cultivating a spiritual life and Heart breathing. Things that I would add to this list are, singing, good nutrition (there is a lot of research into how diet and the gut effect mental health), laughter, making your bed every day, i.e. having self-care and structure, dancing, grounding (this just involves standing bare foot outside for a few minutes every day). Keeping a gratitude diary has also been shown to improve mood. The above is just to give you a taster of the wide variety of creative approaches that are increasingly being employed to address mental health issues.

Many of the above activities are often things that the Church and spiritual communities have promoted and offered to people throughout the ages; through the use of ritual, involvement, meditation and offering prayer/healing. However, the key point I want to make about recovery from trauma is that a person is related to as a whole, not just as body, a mind or a Spirit. However, because the emotional brain is so keenly connected to the body and feelings, treatment often needs to start there. Although the converse can be true, if people are dissociated from their trauma, then often being able to initially talk about it, and build a trusting relationship with their therapist over a long period can be helpful too.

From neuroscience we can see that it is crucial that we are in relationship with others, for example neuroscientists have discovered something called mirror neurons, which are a bit like neural-wifi (specialised cells in the cortex), they enable us to pick up not only on movements but a person's emotional state and intentions. Whilst the presence of mirror neurons is

currently under debate, what we do know is that babies learn by imitation. This is crucial as if a baby has had an angry, depressed or abusive parent, then they will have picked up on this very deeply. This situation could result in the baby dissociating from this very painful experience. For traumatised people to heal they need to be mirrored safely and have an experience that reactivates this part of the brain and helps them to take in healthy mirroring.

In my work with patients another finding from neuroscience has been extremely helpful and this is to do with language. In brain scans when a person is asked to remember a traumatic event, the Broca centre, which controls speech and language in the rational brain goes off line (i.e. when the emotional brain is triggered). This is because in a place of danger, crying out could alert someone to your whereabouts, or trigger more aggression. How this helps is when I work with rape victims, or people who have been attacked, they often are tortured by the thought 'why didn't I cry out for help'. They often weep with relief when I tell them that they had no control over that: their physiology was trying to keep them safe.

Another fascinating discovery, is that brain centres light up in response to metaphor more than in any other form of human communication, which indicates the formation of new neural pathways. This confirms the huge importance of story-telling and encouraging fresh pathways. This of course is something that religious communities and tribal communities have done and it also explains why reading to our children is so important.

One further important point which is also a 'warning' is to comment that when people are in a stress response, the body releases pain numbing endogenous opioids to try to calm the system down. People who have experienced repeated trauma can get addicted to the chemical response they experience

when in traumatic situations. This could be a contributing factor for why people put themselves in dangerous or re-traumatising situations. This is key to know and be aware of, as many religious communities have come a cropper by feeling that by 'loving someone' that will be enough to help them re-orientate to more healthy choices. It is key that when dealing with trauma you know that you are contending with a person's biology as well as their mind.

Der Kolk helpfully summarises his approach to healing. He sees trauma as having knocked out a person's capacity to self-regulate. They become overwhelmed by the emotional brain, by anxiety, stress, fear and anger. Communication between the rational and emotional is either damaged or the two parts operate separately, through dissociation. We all know of people who have achieved extraordinary academic prizes, but can have no social skills or capacities, which rely on empathy (being able to imagine what it feels like for the other person). The rational brain needs to develop skills of information, evaluation, moderation. Crucially we need to get the rational mind to start paying attention to the body and relate to those sensations. I say to my patients that the emotional brain is crucial to listen to; it tells you when you are in danger, hungry, or in need of a hug. But if you let it get in the driving sea ... well I wouldn't want to be a passenger. We all know the advert with the dog walking along and then suddenly 'squirrel!': that's our emotional brain in action.

This is why Mindfulness (which is really meditation dressed up for the 21<sup>st</sup> Century) is so popular and helpful. It teaches the rational mind to be in the present, to focus on sensations in the body and to become an observer. The rational brain can begin to relate to the emotional brain, gently question it: 'is it true that you are in danger?' When our emotional brain wants to eat everything in sight to try to deal with an uncomfortable bodily sensation, shame or fear, the

rational brain may gently enquire 'are you really hungry? Or are you feeling sad, lonely or afraid. What might help?' A baby that has had a parent that has responded in this kind and reflective way, will have internalised those regulatory functions. People who have not had this will resort to primitive defences such as dissociation, denial, substance misuse, and avoidance of the painful feelings.

Severely traumatised people will probably need to start from the body; this is to help the nervous system to calm down. A key starting place can be breathing exercises. Breathing is one of the few body functions that is under both conscious and autonomic control, so it can be helpful to people to recognise that they can have some control over their symptoms, particularly with managing anxiety, panic attacks etc.

This has been a lightening, but by no means exhaustive, tour of findings from neuroscience that can help to inform our approach to mental health. I hope it will also stimulate thinking around how religious practices can incorporate and expand healing approaches to those in need.

### **St Marylebone**

I now want to come to my job as Clinical Director of St Marylebone Healing and Counselling Centre. Although I initially undertook a theological training, I had for many years been disillusioned by many practices within the Church and found a more integrating home within the psychotherapy community. However, when I saw the job advertised at St Marylebone, the role and the centre seemed to be pioneering in its approach to mental health and religion.

St Marylebone has a psychotherapy clinic with 12 psychotherapists who see people once a week for up to two years. We also have a mental health group run by experienced group therapists. Alongside this we have a weekly



communion and healing lunch time service, and once a month on a Sunday evening the Church has a healing service with the laying on of hands. We are based down in the crypt of St Marylebone's church and there is a small chapel where people can sit and reflect either before or after their sessions. Our psychotherapists are all professionally trained and have a faith. We tell our clients that we don't pray in sessions because of confusing the roles within the room, however, we do offer our services in a prayerful way. A further exciting development is that for the last year we have been running a pilot with the London Diocese offering psychotherapy assessments to candidates alongside their other spiritual discernment interviews. So far, we have done 80 of these assessments and it has been an incredible experience to see people from all ages and walks of life passionately wanting to become Priests. However, it has also been striking, how many of these candidates have had early trauma, bereavement, bullying and mental health issues. We are able to give feedback and support to their director of ordinands, through a Helpline that we are currently piloting for any Director / Assistant Directors or Ordinands concerned about the mental welfare of any of their candidates. We also see people for psychiatric evaluations and psychological assessments during their training if necessary.

In the 'third assessments' mentioned above we explore with candidates their resilience, maturity, capacity to relate to themselves and others and to their own history. Significantly, for many candidates, their faith has been a powerful and sustaining factor. However, for others, it has been a way to avoid facing their difficulties and losses. These are the people who concern me, as I fear for what the training – and a life in ministry – will mean for them. My hope is that as there is more of a dialogue and openness to think about mental health, people will feel able to ask for help and robustly face their

difficulties. Otherwise we are not going to have a muscular, relevant faith that can attract and offer vital healing to those who badly need it.

### Conclusion

To conclude, this paper has tried to capture the exciting findings in neuroscience which can help us as we think about relating to our current mental health epidemic, and perhaps also to our own personal history and difficulties. The key message I wanted to leave delegates with at the conference was to discover ways to get the emotional and rational brain in a happier relationship with each other. I mentioned that I have only recently returned to a more formal religious life. However, what amazed me during my time on the 'outside', was how much my theological training, and the wisdom of spiritual teachers came into my psychotherapeutic practice. I would often find myself quoting from scriptures truths that seemed to be so generically powerful. However, modernity has pushed the Church to the fringes, people are disillusioned with priests, frightened of fundamentalism and the damage that is done in the name of Religion. This disavowal of Spirit takes me back to the title of my paper, *When the Spirit is silent* (or silenced as in trauma) *the body cries out*. We have an epidemic of inflammatory diseases as well as mental health problems. The NHS is groaning under the weight of people suffering from smoking, alcohol and weight related diseases. Recent Government figures ([hse.gov.uk](http://hse.gov.uk)) show that 12.5 million days were lost due to work-related stress, depression and anxiety in 2016-17. Spiritual leaders have a unique opportunity to speak into the sadness and sickness of our society. Recently I have been reading a book by the spiritual writer, Caroline Myss, on the writings of Teresa of Avila, *The Interior Castle*. I was struck by how many of her observations of our current

malaise were so accurate and her observation that: 'People are starving for ... the sacred ... to touch, see and feel it. They want to be bound to the sacred by a ceremony, by a vow' (Myss, 2007: 46).

Myss later goes on to say: 'this is why I suggest, no insist, that you have a spiritual practice, a discipline in which every day something is expected of you as an individual. You are not left to your own devices, your own schedule. You maintain rituals that invoke grace' (Myss, 2007: 46). Interestingly, I have just returned from a secular retreat, and was again struck by the thirst for ritual, spirituality and health-giving practices, particularly amongst the younger delegates.

In this broken, traumatised, but still breathtakingly awesome world, we stand as people who are fearfully and wonderfully made. Our bodies and our minds can be healed with gentleness, action, community and relationship.

At the conference, I concluded my talk by inviting delegates to think about their own mental health and well-being. Jung always exhorted the therapist, priest and healer to look within. Commenting on the much quoted Bible verse about 'loving your neighbour as yourself' (Mark 12:31), and the Christian outlook, motivated by the verse 'what I do unto the least of my brothers, I do unto Christ' (Matthew 24:40), he said:

But what if I should discover that the least among them all, the poorest of all the beggars, the most impudent of all the offenders, the very enemy himself—that these are within me, and that I myself stand in need of the alms of my own kindness—that I myself am the enemy who must be loved—what then? As a rule, the Christian's attitude is then reversed; there is no longer any question of love or long-suffering; we say to the brother within us "Raca," and condemn and rage against ourselves. We hide it from the world; we refuse

to admit ever having met this least among the lowly in ourselves. (Jung, 2001: 241).

Basically, it's a tale as old as time, we need to be loved to love ourselves; when we can heal and receive love we can love and be instrumental in helping to heal others. I end where I started, that my paper is fundamentally about the importance of love and why it matters!

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## REVIEWS

**Stephen M. Barr**, *The Believing Scientist: Essays on Science and Religion*. Grand Rapids, Michigan: Wm. B. Eerdmans, 2016, pp. 232, £16.99 Pbk. ISBN 978-0-8028-7370-5.

REVIEWED BY ADRIAN BROWN

Stephen Barr is a professor of theoretical physics at the University of Delaware and a member of the Academy of Catholic Theology. This book is a collection of reviews, lectures and articles all of which were published elsewhere between 1997 and 2013. As such there is the inevitable element of repetition. There is however a chapter of 'Notes and Sources'. That said, and I was not familiar with Barr's writing, he has much to say and on the whole, says it very well.

The longest chapter is the opening one and addresses the perennial question, 'Science versus Religion?' His judicious account debunks the conflict thesis by carefully showing what religion is and is not about and what science can and cannot legitimately attend to. Barr is sensitive to the history of the conversation and his references to specific contributions makes for an interesting read. His conclusion: 'The search for truth always leads us, in the end, back to God' (21).

Then follow a series of pieces under the heading 'Evolution'. Half are book reviews and half are articles penned for *First Things*, which modestly describes itself on its web page as 'America's Most Influential Journal of Religion and Public Life'. Widely seen as both ecumenical and conservative, its aim is to 'advance a religiously informed public philosophy for the ordering of society.' With writers as diverse as Stanley Hauerwas, Roger Scruton, David Bentley Hart and Rabbi David Novak it clearly seeks to throw its net fairly widely. Barr is clearly a theistic evolutionist with little time for 'energetic

propagandists' (25), be they Young Earth Creationists or atheistic polemicists. Barr is prepared to be robust in his criticisms and to my mind is candid without being unfair in unmasking his opponents. Intelligent Design arguments are found wanting and their misjudged strategies exposed and deemed unhelpful. He clearly finds Dawkins exasperating and superficial when addressing religious matters and takes issue with Stephen Gould, whose interpretation of evolution does not necessarily invoke or support atheism. As a good Catholic, Barr subscribes to the Church's teaching that 'no truth of science can contradict the truth of revelation' (53). He defends, with care, the general acceptance of an evolutionary framework for the development of life on earth and is particularly good when discussing what is meant by randomness and chance. Although not sure that neo-Darwinism is sufficient, he nonetheless underscores his belief that we are the result of the thought and action of God. An oft-repeated illustration of Shakespeare writing Hamlet as an analogy for God the Creator is used to good effect in teasing out what theology has traditionally called primary and secondary causes. I am not convinced that Barr has it right in regard to a perceived lack of real freedom of the characters in the play to improvise. He does allow for the possibility that the unfolding of evolutionary history may include 'extraordinary events along the way that contravene (natural) laws' (63). What matters most to Barr is that 'evolution unfolded exactly as known and willed by God from all eternity.'

It was interesting to read successive chapters reviewing Behe's *Darwin's Black Box* in 1997 and then 2010. In the former Barr cautiously welcomes Behe's challenge to the completeness of evolutionary explanations. He writes, 'Even though I have tried ... to maintain an attitude of cautious scepticism regarding Behe's claims, I cannot help wondering how on earth such systems as he describes could possibly have

evolved in a gradualistic manner' (66). A dozen years later, Barr has taken stock. He rightly states that ID has achieved nothing in science and adds that in the realm of natural theology it has only succeeded in pitting ID against mainstream science by asserting the incompetence of science. No wonder that the scientific community has been so antagonistic to the Intelligent Design movement which it perceives as a Trojan Horse for Creationism which, to mix military metaphors, presents itself as a quixotic Charge of the Light Brigade assaulting a well defended modern science. A by-product of which, he suggests, is increasing the audience for the New Atheists and reinforcing in the public mind the perception that science and religion are at war.

The next section collects pieces under the title 'Mind and Soul'. In 'More than Machines' he argues against causally closed physical determinism and materialism in science and philosophy and offers a defence of human freedom, ultimately grounding it in what it is to be made in the image and likeness of God. A question heads the next chapter 'Does Quantum Mechanics make it easier to believe in God?' Barr's answer is that what QM does is indirect, in that QM undermines the sort of materialism or physicalism that stands in opposition to belief in God. He suggests that QM makes it plausible to consider the transcendence of the human mind and thereby the thought that there may be an Ultimate Mind behind the universe. In this sense he is engaged in offering what Peter Berger termed a plausibility structure for belief rather than a knock down argument for the same. Some repetition is evident in the next chapter on Faith and Quantum Theory. His conclusion, after what is a succinct but masterly survey, is that matter itself may be telling us that its connection to mind may be more subtle than hitherto realised. As Wigner observed, 'the content of the consciousness' could well turn out to be an ultimate reality. Although Barr does not use the term idealism

to describe his stance, I am left with the distinct impression that this is where he stands. Not that this is a problem. Keith Ward along with others is revisiting Idealism with some vigour in recent writings. Theists in general have always found it an attractive metaphysical option. The case is open as to whether Quantum Mechanics requires this sort of interpretation of course. 'A Mystery Wrapped in an Enigma' engages with David J. Chalmers on qualia and concludes that simple-minded materialism cannot be right. In the next chapter he welcomes Thomas Nagel's attack on materialism from an atheistic standpoint whilst arguing that Nagel's rejection of dualism is weak. He is clear that Nagel's atheism is not in itself a more satisfactory account than theism. Barr wisely distinguishes between the belief that God is the ultimate explanation of everything and the claim that theism is the ultimate explanation of everything. As a Thomist, Barr is conscious that we do not know, and cannot know the mind of God.

'Matter over Mind' is a review of *Neuroscience, Psychology and Religion* edited by Jeeves and Brown. Barr uses it to remind his readers that there is nothing in neuroscience or physics to deny the distinction between mind and matter and the observation that each can affect the other. In the next chapter, 'Theories of Everything' he engages with the writings of John Maddox. He applauds Maddox for a profound grasp of unsolved problems in the biological sciences but takes him to task for an inadequate grasp of cosmology and particle physics. Barr does not see a Theory of Everything as a threat to religious belief given that would be a TOE merely of the physical world and if found, would be a source of wonder in mathematically modelling the elegant unity and beauty inherent in the created order.

For me the most impressive chapter of the book is a magisterial survey entitled 'Modern Physics, The Beginning,



and Creation'. This lecture unpacks what is meant by the Creation of the Universe and how we relate this to our modern cosmology and cosmogony. This is as good as you will get in a mere 13 pages. The following chapter, also originally a talk, addresses similar themes. In 'Physics, The Nature of Time, and Theology' I found myself making more marginal notes than anywhere else. There is a clear outline here of a very traditional Catholic understanding of persons and issues of time and how to speak of God's relation to both. I think that there are important problems he underplays, notably with regard to the impassibility of God and of how we might speak, using some analogous temporality, of the dynamic life of the eternal GodSelf (may I suggest 'Trinitime'?). In the final of three pieces on 'The Big Bang and Creation' he takes Hawking to task in his book with Mlodinow regarding the origin of the universe from a 'quantum fluctuation'. Not only is this speculative, it is certainly not a creation from 'nothing'. In physics jargon this nothing is a something; the question is begged. The laws of physics alone cannot decide between theism and atheism and their respective answers to the perennial question, 'Why does anything exist rather than nothing at all?' (155).

A nuanced discussion of reductionism in 'Fearful Symmetries' contains a helpful introduction to the idea of spontaneous symmetry breaking in fundamental physics. In it Barr claims, 'The order we see in nature does not come from chaos; it is distilled out of a more fundamental order' (162). His other musings on reductionism in science relate to the human genome project in which he expresses concerns about what we might do with the partial knowledge we now possess. We are underdetermined by our genetics. His correct resistance to the notion that we are mere sequences of digits does not entail belief in an immortal soul however. Here we see Barr in his role as guardian of Catholic orthodoxy.

Barr resists any idea of science as a substitute for religion in his review of E. O. Wilson's *The Creation*. He has little time for Wilson's 'ignorance of the Western religious tradition', and castigates him for a basic Naturalist error of confusing the causation of the whole play of the universe with causal relationships within it. In the subsequent chapter, a review of *Unweaving the Rainbow*, Dawkins comes in for similar scorn. The discoveries of science do not lead to the conclusion that it is all 'pointless'. The beauty of nature signals for others, a Wisdom greater than our own.

So, can we find God through science? Contra the mantra of modern atheism, 'the good news is that the bad news is wrong' (189). Barr's view is clearly that, if anything, modern science makes theism more likely. One of his favourite guides to all this is clearly Francis Collins's *The Language of God*. It was good to be reminded that in the USA where some surveys suggest that 45% of the population are Young Earth Creationists, the real danger is 'not to science but to faith' (197).

Finally Barr offers us a neat reminder of the facts surrounding the Galileo affair and a rebuttal of those who perpetuate the simplifying and distorting myths surrounding it. He closes the book with an unflinching swipe at 'crackpots' who write nonsense about technical matters that should be left to the experts. What is clear to me is that Barr has every right to be considered an expert, both in his professional career and as a thoughtful contributor to the ongoing conversation between science and faith.

I only detected one spelling error: Bayesian on page 58 should be Bayesian. This does not detract from what is a stimulating and valuable collection.

**Simon Oliver, *Creation: A Guide for the Perplexed*.** London: Bloomsbury T&T Clark, 2017. pp. 176, £16 Pbk. ISBN: 978-0567656117.

REVIEWED BY PHILIP CHAPMAN

Simon Oliver's account of the Christian doctrine of the creation is richly satisfying. He sees it as 'a pure act of gratuitous love' (p. 59). The following notes are not a summary of the work. They do aim to indicate its scope and some of its insights. Oliver does not intend to deal with scientific questions about beginnings. He focuses on the developing relationship between science and religion from early times. Drawing on the work of Peter Harrison, he makes use of recent readings of the history of science.

Above all the book is about meanings. The stories in Genesis do not record certain facts of cosmology, natural science or history, they do point towards the theological meaning of creation. Oliver speculates that an aspect of the *imago dei* is humanity's share in what had previously been seen as purely divine, namely rest (p. 20). Going beyond traditional understandings of 'by the sweat of your face you will eat bread' (Gen 3:23) Oliver holds that humanity is not designed for work especially when it is demeaning, degrading or valued only for its monetary reward. Humanity is rather created for worship. In naming the creatures, man places them in an ordered scheme rather than taking authority over them. This anticipates later science which will make its own reasoned version of the cosmic order that Genesis depicts through myth. The structure of the creation indicated by Genesis connects with the ordering of Hebrew sacrificial worship. It thus anticipates the Eucharist, which Oliver understands as the central action of the Christian Church.

Christian tradition, like that of Judaism and Islam, takes creation as *ex nihilo* – out of nothing – although, as the author points out, Scripture nowhere explicitly says this. That doctrine is not to be confused or conflated with the scientific hypothesis of the ‘big bang’. Neither is God an item on a list of existing entities. God is rather the author – the origin and sustainer of whatever exists. Oliver rules out panentheism as well as pantheism. The creation is God's good gift freely given. God is in all ways distinct from it.

Created things, that is to say ‘creatures’, thus have a significance in themselves, in addition to any purely metaphorical one. There is an intrinsic meaning invested by their giver (p.102). Creatures can be effective channels of divine grace, beyond their practical importance for human existence or purposes, beyond also their interest as objects of investigation or as supposed instances of the Creator's ingenuity. An especially helpful discussion of Aquinas shows how his philosophical doctrines support such insights. They were lost or contradicted in Protestantism at the Reformation and afterwards. Luther taught scripture without the patristic marginal comments that had grounded multilayered interpretations. Thus the collegial exegetical practices of the teaching Church were replaced by a supposition that the Holy Spirit would guide individuals to the unique meaning of Holy Scripture. That also encouraged personal investigation and observation in other matters. There were unambiguous empirical facts to be discovered. Francis Bacon and his successors saw nature as the product of an ingenious manufacturer whose methods could be discovered and perhaps further applied, rather than in its true theological status as a sacrament with its own meanings.

The author certainly doesn't seek to deny scientific explanations of the origin and physical properties of created things nor the extent of science's mastery over nature. He does

want us to understand the transcendental significance of the creation as gift to itself including to ourselves as created beings. It has its own meanings independent of any usefulness to humanity. A gift must not be exploited as a commodity. That raises fundamental questions about market economics and human relationships with the natural world both animate and inanimate. That must include whatever there may be within our reach but beyond this planet. In Oliver's view the answers will be related to eucharistic theology.

The book repays attentive reading: especially by cradle Protestants like the author of this note.

**Russell Stannard, *The Divine Imprint: Finding God in the Human Mind*.** London: SPCK, 2017. pp. 194, £9 Pbk. ISBN 978-0281078103.

REVIEWED BY FREDERICK TOATES

Russell Stannard was the first Professor of Physics to be appointed to the Open University and one of the university's founding spirits. Now retired from the O.U., he is also a lay preacher and author of numerous books on science and religion. Stannard is perhaps best known for his Uncle Albert books in which he manages to teach highly complex physics to children. The present book is a beautifully written account of the link between science and religion. In an endorsement, the psychologist David Myers of Hope College, Michigan, writes

Russell Stannard is a master at explaining big ideas in simple prose. He is also one of the world's great communicators at the boundaries of science and faith.

This new book bears very good witness to this claim. Always crystal clear, it ranges far and wide throughout the sciences, but I shall focus upon psychology.

Stannard opens by noting that, in the UK and Northern Europe, religion is in decline. He suggests several reasons for this, such as in earlier times there was not much else to do on a Sunday apart from going to church and he continues (p.1):

... there has been a substantial increase in the general level of prosperity. Health levels have improved and life expectancy has been substantially extended. This doubtless encourages people to feel more self-sufficient and consequently in less need of the comforts and support offered by religion.

But he notes that probably the single most important factor in the decline in religion is the rise of science and the implicit, if not explicit, assumption that religion and science are in conflict.

So, reflecting on the book's title, how is one supposed to find God's presence in the world? As a foundation of the book, Stannard suggests that the existence or not of God cannot be decided by *experimenting* on the natural world. (Incidentally, Stannard once wrote a book on trying to do controlled experiments on the efficacy of prayer.) Rather, he infers God's hand from, amongst other sources, *observations* on the natural world.

Stannard devotes much of the book to psychology, not surprisingly coming out in favour of Jung over Freud, and giving a thoughtful account of evolutionary biology and psychology. He goes to great length to be fair to evolutionary psychology, putting the case very well for a secular understanding of brain and mind with its help. He shows just how much insight can be derived from evolutionary psychology and then describes its short-comings. If the human brain/mind is part of a glorified gene perpetuation machine, what sort of properties would we expect it to exhibit? The author notes that it does indeed possess precisely those properties that appear to have been shaped to maximize

genetic perpetuation. However, it also exhibits properties that would not be expected on such a basis, indeed some being quite the opposite of this. He associates these properties with God and describes them as 'God-like'.

It might be argued that this is a version of the 'God of the gaps', i.e. God comes to the rescue when scientific explanation reaches its limits. However, this would not be fair since the book does not simply fall back on God to explain the gaps but also fits the whole picture including the process of evolution to the notion of a creator. As a suggestion for another book, the author might like to look at the life-history of individuals and see the limitations of, for example, neuroscience and behaviourist accounts.

Stannard describes the argument from biological design, most usually exemplified in that an eye is so perfectly suited to its function that it suggests a designer. However, he notes that gradual emergence of complexity through evolutionary stages provides an alternative explanation. Similarly, the fine-tuning of the universe suggests the hand of a super-intelligent creator having the emergence of intelligent life in mind but then the idea of a multiverse with ours being just one amongst millions of others offers an alternative, albeit not a very parsimonious, explanation.

A foundation of the book is represented by the following quotation (p.19):

To a much greater extent than other animals, we are self-aware. We are able to reflect on what we are doing. There is no need to act as blind robots. We can go against inherent, instinctive behavior if that is what we decide to do, perhaps in response to some higher demand.

In his search for God, Stannard places a principal focus upon mental events and the phenomenon of the emergence of consciousness, writing (p.39):

Consciousness is a mystery. By that we do not mean a puzzle awaiting a solution. We are using the word 'mystery' in the sense of something that is likely always to lie beyond human understanding.

He continues (p.157):

Claiming that biology gives rise to consciousness when there is a complete absence of any explanation as to how this comes about becomes a matter of faith rather than science.

This is very true and, as the philosopher Jerry Fodor noted, we not only do not know how to answer this 'hard question' of consciousness, we don't even know how to frame the question properly.

Stannard notes that it is a perfectly reasonable assumption that, just as he has conscious experience, so too do other individuals. It would be the height of egocentricity to assume that there is only a single witness to the experience of consciousness and yet we have no proof that anyone else apart from ourselves is a conscious being. Others might be zombies acting as if they are conscious. Stannard argues that, in terms of genetic perpetuation, all the *behavioural* actions of an individual might be explained perfectly well in terms of movements of biological matter in space and time, the business of the biological sciences. In principle, a designer of an artificial human would never need to worry about how to introduce consciousness into his or her invention since it would do everything just fine by employing only biological materials. Such physical movements are all that is required to survive and reproduce, so why conscious awareness and any subjective conscious feelings? He writes (p.52):



According to materialist philosophy, consciousness is of secondary importance. It is something that just happens to run in parallel to what really matters, namely what is going on in the physical brain. It is dismissed as an *epiphenomenon*.

On the topic of the passivity of conscious awareness implied by epiphenomenalist theories, Stannard argues (p.57):

Why waste valuable time and effort contemplating various alternative courses of action when, according to the materialist, none of them can be taken?

Stannard would seem here to dismiss implicitly alternative philosophies of mind, since epiphenomenalism is not the only model or even the most popular model advanced in neuroscience these days. Identity theory probably is most representative and Stannard's criticism might not apply if identity theory provides a better account. According to identity theory, the mind *is* the brain expressed in another language. There is no aspect of mind, conscious or unconscious, that does not have a one-to-one representation in the activity of the physical brain and the conscious mind can be considered to be the cause of behaviour just as can the biological brain.

Although describing correlation, Stannard considers the issue of causation from the physical domain to the mental, e.g. someone taking paracetamol and noting a relief from headache. In contrast, he considers someone making rational decisions and suggests that: 'It is now a case of mental decisions being made and these leading to the appropriate physical actions' (p.159). Identity theory would reject such causal sequences of either biological→mental or mental→biological, since in identity theory terms, the mental is the biological expressed in a different language. By analogy, you don't have an (English) house and at the same location a

(French) maison, since the maison is the house expressed differently. Wave-particle duality in physics is also given as a possible analogy.

This theory might offer insight but then it might not! Just suppose that, at a certain level of brain complexity, consciousness emerges in parallel with brain activity. Conscious thoughts accompany certain brain states corresponding one-to-one with them. It could be that this combination proves better at making adaptive behavioural choices than the brain without this emergent property. However, this model still suffers from the problem of understanding how 'hot' consciousness emerges from 'cold' inanimate matter. Let us put the latter problem to one side for the moment.

Such things as simple reflexes might well be explicable with no resort to consciousness. Indeed, just try putting your hand under a hot tap and see how quickly you pull it back. It is well under way before there is any conscious perception of pain. Psychologists are showing more and more evidence that quite complex goal-directed behaviour can be executed in the absence of any conscious insight into the cause of the behaviour. None-the-less, there are situations that call for full conscious insight, e.g. resisting temptation or dealing with completely novel situations. In such cases, the conscious mind is in the driving seat and it is possible that the brain-mind identity combination is best at solving them.

Stannard then turns to the closely-related issue of free will and discusses the famous experiment of Benjamin Libet, which appears at first to undermine the role of conscious agency in determining behaviour. Frankly, I have no idea what the expression 'free will' means but I feel that I possess it to a limited degree and at least I have some idea as to what *it is not*, i.e. strict determinism by genetic and environmental factors. As I argued some years back (Toates, F. (2006) 'A model of the

hierarchy of behaviour, cognition, and consciousness'. *Consciousness and Cognition*, 15(1), 75-118), a task of the kind used by Libet would hardly require much in the way of conscious resources and might well have been relegated to a low-level control. Where free will (whatever it means!) seems to enter the picture is in, for example, Libet's participants slowly weighing up the pros and cons of participating in the experiment in the first place.

Although Stannard briefly mentions near-death experiences (NDEs), my feeling is that his case could be much strengthened by a deeper consideration of paranormal phenomena, such as NDEs, out-of-body experiences, telepathy and remote viewing. There is an extensive literature on such topics, pointing to the reality of gaining information by paranormal means. The conservative Christian position seems to regard the investigation of such phenomena as akin to dabbling in shady phenomena such as Ouija boards and Victorian séances in dark rooms. I wonder whether this has rubbed off on Russell.

It is fascinating to note that the author describes the assumption in physics that everything that has ever been is still available in some form, a sort of universal memory. Interestingly, those having had near-death experiences commonly report a life review in which their life experiences and the experiences of those they have influenced flash before them. Could this represent tapping into some informational source outside the physical brain? Like with so much else in this book, the mind boggles!

In summary, I strongly recommend this book.

**Roger Trigg**, *Does Science Undermine Faith?* London: SPCK, 2018. pp. 42, £3.99, Pbk. ISBN 978-281078684.

REVIEWED BY LOUISE HICKMAN

This short book forms part of an SPCK series, 'Little Books of Guidance', introductory books on a range of theological topics. Titles of other volumes include *What is Christianity?* (written by Rowan Williams) *Why are we here?* (Alister McGrath) and *Why does God allow suffering?* (Robin Gill). The addition of a book on the relationship between science and religious faith is welcome, particularly because of the way so many 'lay' non-specialists risk having their views of this subject dominated by media stories of unrelenting conflict. Trigg's book is an excellent introduction to the science-religion conversation, giving a succinct overview of some of the most important developments in the field through a discussion of the most oft-asked questions.

The first chapter, 'Does science disprove God?' essentially argues 'no' through a consideration of the limitations of science. Trigg resists postmodernism and subjectivism: science searches for truth. This search, however, can only ever be limited and provisional, which means science cannot make any claims to disprove God. Furthermore, if we are to trust scientific insights, we must go beyond science itself to justify this belief in the scientific method. 'Are Science and Religion just different?' is the question of chapter Two. Trigg's answer here, again, is 'no' and he argues against any theory of 'non-overlapping magisteria'. A belief that the world is God's creation means that it has meaning and purpose that science can discover, and that these discoveries are relevant to religious faith. Faith is also relevant for science because science rests on a belief that humans can attain truth through reason. Chapter Three asks, 'Could Science support Christianity?' Although

science can neither prove nor disprove religious faith, Trigg suggests, by way of the 'anthropic principle' and the cognitive science of religion, that reason can 'make a cumulative case for the rationality of the Christian faith' (32). CSR shows how deeply rooted religious beliefs are, and they shouldn't be discarded 'by some definition that says they produce unscientific beliefs' (32). Belief in the scientific enterprise collapses without belief in human rationality. This argument is developed in the last chapter 'Does Science need Christianity?' It is a presupposition of science that it is universal in scope, and that we can trust reason and grasp truth, and Trigg argues the 'Christian idea of a God who has freely chosen to create this kind of world, but does so in a rational way, gives warrant for these views' (36). In this way, science does have a need for theistic faith. Furthermore, as Trigg points out, science alone cannot tell us how to use the knowledge we gain.

*Does Science Undermine Faith?* packs a lot in to a slimline volume. It might be short but it is far from shallow: the discussion, for example, includes in its scope logical positivism, materialism, and subjectivism, taking in thinkers as diverse as David Hume, Stephen J. Gould and Charles Coulson, all presented in a way that is accessible and engaging. There is plenty of food for serious thought here, both for atheists and for theists. Readers of all faiths and none who are looking for a way into this subject will be provoked into thinking more deeply and theologically. This book will be particularly useful for people working in ministry and education who are looking for a text to recommend to those who are new to this subject, or to anyone who just wants to develop their theological reflections. It is an ideal introduction to science and religion that will be useful for opening up debates at the forefront of this academic field to non-specialists.

**REVIEWS REPRODUCED FROM ELSEWHERE**

**Chris Willmott and Salvador Macip, *Where Science and Ethics Meet: Dilemmas at the Frontiers of Medicine and Biology*.** Santa Barbara, CA: Praeger, 2016, pp. 180 £29 Hbk. ISBN-13 978-1-4408-5314-6.

REVIEWED BY PHILIPPA TAYLOR

First published in *Science and Christian Belief* (2017) 29:2, pp. 188-9. Reproduced with the kind permission of the author and editor.

Having read some of Willmott's previous work, I was expecting *Where Science and Ethics Meet* to be a good—and useful—read and I was not disappointed. This is a very engaging book and a perfect introduction to the minefield that is bioethics.

*Where Science and Ethics Meet* tackles moral questions at the frontier of medicine and biology. In nine chapters, the book covers many of the better known medical ethical dilemmas, such as genetic screening, prenatal diagnosis, genetic modification, organ donation, cloning, stem cell research and regenerative medicine – although not abortion and assisted suicide. The authors tackle human enhancement, using examples from track and field to show how gene doping is the next challenge beyond performance-enhancing drugs. They also use the examples of chemical enhancers and cyborgs to illustrate the difficulty with drawing and holding a line between treatment and enhancement.

In the later chapters, they review less well known developments such as DNA profiling and databases, brain

imaging in criminal investigations, synthetic biology and lastly, ethical issues associated with scientific research (such as fabrication, plagiarism and conflicts of interest). I found these later chapters particularly interesting and useful, taking me into issues and ethical dilemmas that I have not considered in real depth before.

The book is aimed at the more popular level. Each chapter quickly draws the reader in, using a hypothetical, provocative, story that neatly encapsulates a particular ethical challenge. Although fictitious, the stories are cleverly close to real life situations, making it easier to appreciate that many of the latest developments in science, and their associated consequences, are not just fiction but real life. Each chapter is peppered with plenty of real life examples, useful references and explanatory boxes which all serve to make the scientific and medical detail more accessible.

By the end of each chapter, the authors have set out measured ethical arguments for and against the issue central to that chapter. They deliberately leave readers to come to their own conclusions about the ethical and social consequences of each technology, which is not easy for the reader as there are rarely easy answers to the ethical problems we face today. Some may find the absence of direction a bit frustrating (I would certainly like to know where the authors themselves would draw lines, and why) but this would counteract their aim of providing the information and the tools for the reader to do some work and reflection for themselves and to come to their own, now better informed, conclusions.

*Where Science and Ethics Meet* is not written with any religious perspectives at all. So, again, any reader wanting to know how, say, Christianity or Catholicism in particular might direct us to think on an issue or moral dilemma will be disappointed. The book is clearly intended for a secular audience and the writers' personal views do not come

through. Both authors are lecturers at Leicester University and this book reflects their experience in teaching and engaging students and, as such, offers ideal material for students from a range of disciplines – science, medicine, ethics, law and sociology. Indeed, the book will also provide me with useful material for talks and discussion starters. I plan to keep it to hand!

With its emphasis on readability and its coverage of a fairly wide range of issues, inevitably this is not a deeply analytical study and is correspondingly light on ethical theories and some of the science. Although it manages to be creditably up-to-date on many key bioethical debates that modern society is encountering, inevitably, in such a fast moving field, the book is already missing useful discussion on newer techniques such as CRISPR (which is only mentioned in passing) and the creation of three parent embryos. However the authors pre-empt this concern to some degree by saying that they have still done their job by equipping the reader with: ‘a few more tools to evaluate not only the plausibility of the innovation from a scientific point of view but also the appropriateness for society’ (159).

This book turned out to be an enjoyable and stimulating read. But don’t let that suggest there is little depth to it – there is enough meat here to satisfy anyone who wants to be better informed and to think seriously about ethics at the frontier of medicine and biology. And for those who know it all already (!) this book would be a great resource to keep to hand for talks, discussions and teaching.



**H. Floris Cohen, *The Rise of Modern Science Explained: A Comparative History*.** Cambridge: Cambridge University Press, 2015, pp. 296, £18.99 Pbk. ISBN 978-1-107-54560-1.

REVIEWED BY ALLAN CHAPMAN

First published in *Science and Christian Belief* (2017) 29:1, pp. 62-62. Reproduced with the kind permission of the author and editor.

Historical explanations work on many levels, and what I realise from Professor Cohen's *The Rise of Modern Science Explained* is how his perception of the past differs from my own. Yet let me make it clear that I regard this book as a truly masterly analysis of those circumstances which occasioned 'the rise of modern science', from classical Athens to the present day. And I also, like Professor Cohen, Joseph Needham, and many others, have puzzled over why modern science is so much a child of *Western* civilisation. This circumstance becomes especially interesting when Cohen spells out in detail how the Chinese and Islamic approaches to natural knowledge made major and fundamental advances before, and independent of, the West. Yet somehow, these advances, and even 'transformations', or cross-fertilisations of ideas among cultures, somehow ran into the sand, whereas in post-1600 Europe they took fire.

In his first two chapters Professor Cohen analyses the growth of organised natural knowledge in China, Athens, Alexandria, and the medieval Islamic and Christian worlds. His second chapter concludes with how a European 'trend-watcher' in 1600 might see the way ahead on the back of what had taken place in medieval and Renaissance times.

In what is clearly a concern with decisive ideas and intellectual insights, Chapter 3 elucidates 'Three revolutionary transformations': firstly, Kepler, Galileo, and the new mathematics; secondly, Beekmann and Descartes, representing a new 'Athens plus'; and thirdly, Bacon, Gilbert, Harvey and van Helmont, with their emphasis upon observation and experiment.

The following three of the book's six chapters examine the intellectual circumstances in Europe which both were conducive to, and, in the case of the Thirty Years War, potentially threatened, Western scientific development. From a theological perspective, Professor Cohen also suggests that Catholic Christianity's outward-looking approach perhaps inclined it to an intellectual openness, curiosity and interest in innovation which was not found elsewhere in the world. This, argues Cohen, contrasts with what happened in Islam, which, after a 'Golden Age' in the tenth and eleventh centuries AD, became increasingly inward-looking, both intellectually and spiritually.

What happened in the West, however, is that a powerful intellectual dynamic developed, as scholars and natural philosophers built upon each other's work, to bring about a major point of convergence in the Newtonian synthesis.

The concluding 'Epilogue' enquires into the ideas and circumstances that paved the way for an 'Industrial Revolution', especially in Great Britain, followed by subsequent developments leading into the near-contemporary world.

*The Rise of Modern Science Explained* is an elegantly-crafted piece of historical architecture, rooted in epochs, changes and great *intellectual* developments. There are no facts or events discussed in the book with which I take issue, although in many respects my own vision of humanity's scientific past differs somewhat from Professor Cohen's.

For one thing, my own perception of scientific history places less emphasis upon intellectual developments and more on the random play of unexpected, even 'messy', practical circumstances which often turned history about. One hugely significant factor behind the 'Greek experience', surely, was not just the deliberations of philosophers, but also the chance spin-offs arising from that nation's experiences as a great 'long-haul' maritime and commercial trader, in a way that did *not* happen in China or in Islam. The exigencies of living on islands, venturing over horizons, and discovering that an eclipse seen at 9 a.m. in Spain was seen at noon in Athens, compelled one to think about practical geometry, astronomy, and the behaviour of the heavenly bodies in a new way: especially if you had to rely on those bodies to guide you home!

A similar set of physical circumstances, I suggest, acted as a spur to Renaissance and post-Renaissance European science. It had been the Ottoman destruction of Christian Byzantium in 1453, driving Spanish and Portuguese navigators down the Atlantic in the hope of an alliance with the legendary Christian king Prester John, that unexpectedly led to the West's transformation of global geography after 1460. These voyages, and their 'spin-offs', brought a flood tide of new natural factual data into Europe which the traditional Aristotelian and Ptolemaic philosophies simply could not handle, and which demanded a fundamental re-think of the natural world. This included discoveries in geomagnetism, meteorology, geography, botany and zoology, to name but a few.

Discoveries made in the pragmatic school of chance demanded a different investigative approach from that of scholarly cogitation. It was not for nothing that Bacon, the prophet of the experimental method, was an overt admirer of the great navigators, and in his *Novum Organum* (1620) advocated experimental investigations into heat, magnetism,

meteorology, and so on. Of course, Professor Cohen discusses many of these discoveries, yet, I felt, without saying much about which circumstances in that world first aroused curiosity.

From my own perspective, I would put greater emphasis on other causal factors lying at the heart of Western science. These would include the legacy of Roman Law, and later the British Parliamentary system, in providing a model for stable, or at least self-correcting, constitutional governments of a kind not found in the Muslim world. The potentially damaging Thirty Years' War, mentioned by Professor Cohen, was, after all, stabilised and terminated via the negotiated Peace of Westphalia of 1648. And all of this took place within the wider context of a society, and an ethical attitude towards the value of human life, that derived from the Judaeo-Christian tradition.

Likewise, I would place far more emphasis on the contribution of a negotiated, stable, politically-libertarian, free-market economy to the rise of the British so-called 'Industrial Revolution' (in contrast to the absolutist, state-directed nature of French technology) than just the action of great ideas.

Indeed, I have always had qualms about historical interpretations based upon 'Revolutions', even though Professor Cohen identifies no less than six such events in the seventeenth century alone. History, in my own perception, has always been too chance-driven and ragged at the edges to be defined within neat intellectual categories, and this is one of the key reasons why it has always so fascinated me.

But not everyone thinks alike, and I fully respect Professor Cohen's perspective. And within the genre of intellectual history, his *The Rise of Modern Science Explained* is an interpretative tour de force.

NOTE: This Journal aims to publish original and reprinted reviews of books published in the science-religion area. The Editor regrets that she is not able to publish, or enter into dialogue on, original articles not tied to a book in the field.