



# **GALILEO COMMISSION**

## ***THE LAYMAN'S GUIDE***



# **BEYOND A MATERIALIST WORLDVIEW**

*Towards an Expanded Science*

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**Tabitha Jayne & Harald Walach**  
on behalf of the Scientific and Medical Network



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The Scientific &  
Medical Network

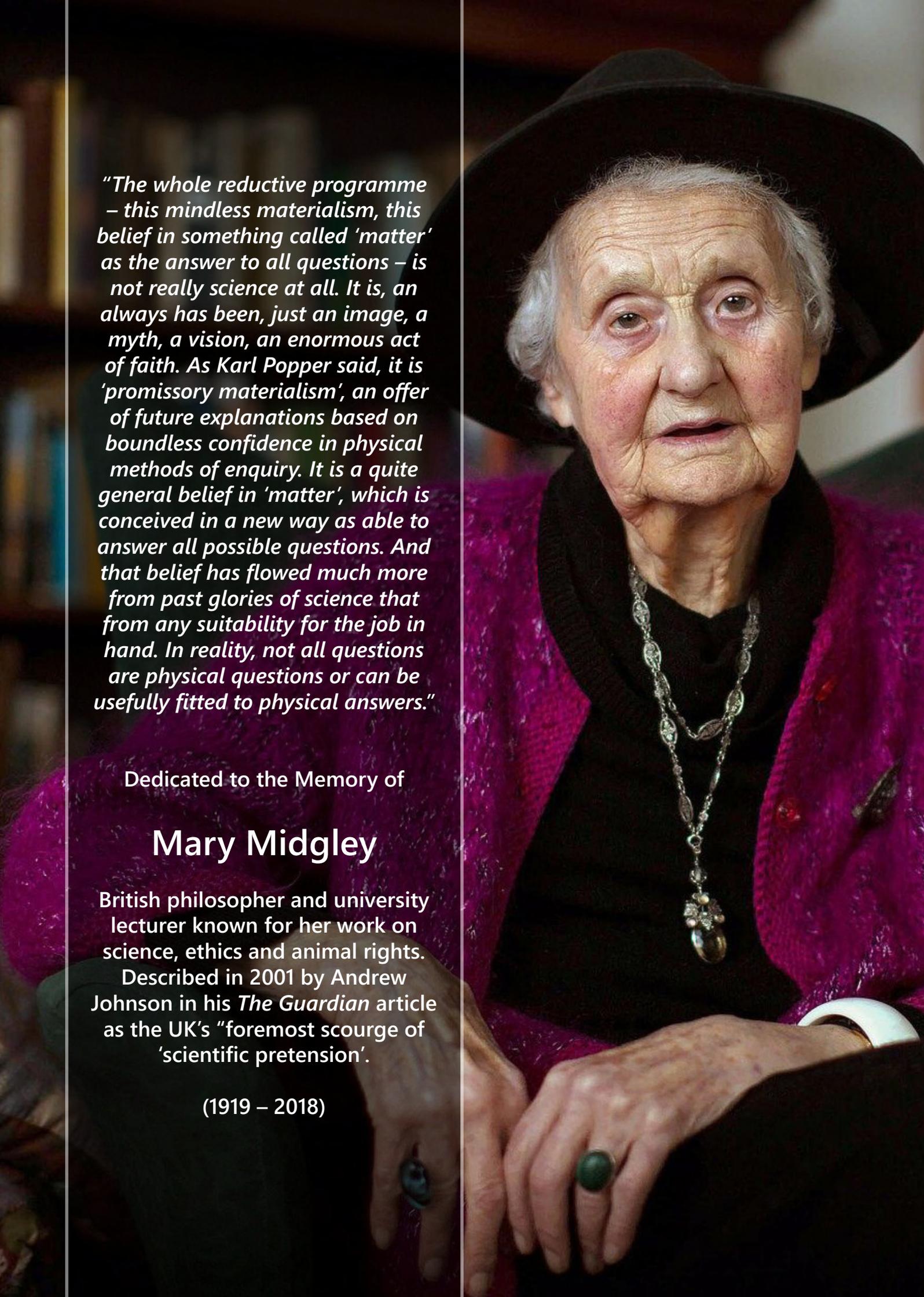
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# **THE LAYMAN'S GUIDE TO THE GALILEO COMMISSION REPORT**

*Beyond a Materialist Worldview*

*Towards an Expanded Science*

A portrait of Mary Midgley, an elderly woman with white hair, wearing a black wide-brimmed hat, a black turtleneck, and a vibrant magenta textured jacket. She is wearing a silver necklace with a large pendant and a green ring on her left hand. Her hands are clasped in front of her.

*"The whole reductive programme – this mindless materialism, this belief in something called 'matter' as the answer to all questions – is not really science at all. It is, and always has been, just an image, a myth, a vision, an enormous act of faith. As Karl Popper said, it is 'promissory materialism', an offer of future explanations based on boundless confidence in physical methods of enquiry. It is a quite general belief in 'matter', which is conceived in a new way as able to answer all possible questions. And that belief has flowed much more from past glories of science than from any suitability for the job in hand. In reality, not all questions are physical questions or can be usefully fitted to physical answers."*

Dedicated to the Memory of

## Mary Midgley

British philosopher and university lecturer known for her work on science, ethics and animal rights.

Described in 2001 by Andrew Johnson in his *The Guardian* article as the UK's "foremost scourge of 'scientific pretension'".

(1919 – 2018)

# CONTENTS

Page 1 ..... Preface

Page 2 ..... Introduction

Page 5 ..... Chapter One: *Problems of a Materialist Science*

Page 11 ..... Chapter Two: *The Need to Explore Background Assumptions*

Page 17 ..... Chapter Three: *Key Assumptions of Modern Science*

Page 24 ..... Chapter Four: *Limitations within Modern Science*

Page 35 ..... Chapter Five: *A Role for Consciousness*

Page 44 ..... Conclusion

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Designed by Liam Howard | Creative Cause

# PREFACE

When the Galileo Report was first published, it became clear that the scientific format was difficult for the general public to follow. The layman's guide was created to bring the wisdom contained within the report to a wider audience.

We are at a critical time in the history of humanity. The ideas contained within the report provide solid evidence on what is needed to expand science and help humanity evolve in the face of its current challenges.

I was a child when I first came across some of the research presented in this report. It captured my interest and has helped shaped my own career. Reading the Galileo Report was like someone had taken my own reading and research for the last 30 years, condensed it and filled in a number of missing gaps.

Much of the substantive editing that I did to create the layman's guide consisted of researching the importance of the people referenced in the report to help give context for those who are not familiar with the field. I also simplified the science and pulled out the story.

The Galileo Report is a story about science and how it has become a religion. It is a story about the evidence that shows it is time for science to start questioning its own assumptions and become relevant to address the challenges of the 21<sup>st</sup> century.

I have only been able to write this as a story because of the hard work Harald did in writing the original report. A full list of references is available in the original Galileo Report. There is also more information about the more philosophical and technical aspects of the argument. In writing the layman's guide, I have attempted to follow the full report as closely as possible so that the wisdom within can truly shine out.

As the impact of Covid-19 continues to play out in the world, the arguments contained within the Galileo Report have an even deeper significance. They highlight the conflict over the accuracy of science and political decisions along with a lack of public trust. More importantly, the Galileo Report offers a solution.

Tabitha Jayne

Haddington, East Lothian, Scotland

November 2020

# INTRODUCTION

*“The lens defines not only what we will accept, but what we can see; anything not adapted to it is either unseen, or, if our attention is drawn to it, dismissed.”*

~ Dr Iain McGilchrist

Galileo was a 17th Century astronomer, physicist and engineer who was considered the father of modern science by Albert Einstein. Inventing his own telescopes, he was the first person to identify the moons that surrounded Jupiter, to recognise the phases of Venus and observe the rings around Saturn. These observations strengthened his belief in Copernicus' theory that the Earth and the rest of the planets revolved around the sun. This was in direct challenge to the existing authority of Scripture and Aristotle. These beliefs stated that the Earth was at the centre of the universe, placed there by God.

In a letter to his fellow-astronomer Kepler, Galileo wrote: 'Here at Padua is the principal professor of philosophy, who I have repeatedly and urgently requested to look at the moon and the planets through my glass, which he pertinaciously refuses to do.'

Galileo's ideas were so revolutionary that he ended up being suspected of heresy and placed under house arrest until his death by the Roman Catholic Inquisition. His books were banned and it took over 200 years for the Church to accept his ideas as fact.

Today, science faces a similar challenge with many scientists unwilling to 'look through the telescope'. There is a growing body of evidence that suggests consciousness exists beyond the brain. Yet the prevailing assumption within science is that consciousness is generated *in and by* the brain.

That consciousness exists beyond the brain is not a new idea. Nineteenth century North American philosopher and psychologist William James highlighted long ago that there were three possible ways to think about the relationship between the brain and consciousness:

1. The brain produces consciousness
2. The brain permits consciousness
3. The brain transmits and filters consciousness

William James acknowledged that normal research supported the first theory even as he recognised that the psychical research of his day provided evidence that challenged this. In today's world, the view that the brain produces consciousness is actually a philosophical assumption rather than a scientific fact. Any other suggestion is dismissed as Dr Iain McGilchrist highlights at the start of his introduction to the main report.

This is the challenge to science. It is based on a set of assumptions, like the one above, that are seldom articulated even though they create not only the methods that we use in science but also generate a particular worldview which is known as 'scientism': excessive belief in the exclusive power of scientific knowledge and techniques.

The Galileo Commission is a project of the Scientific and Medical Network. The Network is a worldwide professional community that promotes open-minded, rigorous and evidence-based inquiry into themes that bridge science, spirituality and consciousness. The Galileo Commission was initially made up of a distinguished group of over 90 scientific advisers who are linked to 30 universities worldwide.

## THE CRUX OF THE MATTER

Science is the only peaceful, collaborative enterprise of humanity that has benefited the most people around the world. It has created a worldwide culture of collaboration, investigation, invention and seeking after truth. Science has a grand history and will have an even grander future.

This report is about challenging the forces that weaken science. Science is currently under attack. On one side, we have well informed critics who are trying to advance various agendas, whether they be economic, political or religious. On the other hand, we have a public disenchantment with the reliability of scientific findings, sometimes even from within the scientific community itself. As the Covid-19 pandemic continues to unfold, we see this playing out in the science that is shared with politicians and the criticism that emerges around it.

In a time of worldwide social injustice, ecological crisis and the threat of global economic breakdown, we need science more than ever. Yet to advance science, we need open discussion of its widespread background assumptions. These assumptions direct how science is done. They influence decisions about funding and publications. The careers of young researchers are impacted. How the media and the general public view science are all affected by these assumptions.

This report is about questioning its existing implicit background philosophy. The main argument of this report is that the Galileo Commission calls for more and better science that has a wider perspective and a broader philosophy. It suggests that science can improve because it isn't actually scientific or conscious enough about its own approach and its implications.

Science is about being *curious* about the riddles of the universe. It is about being *open* to potential answers, even if they are unexpected. Science involves being methodical in approaching the problems by using *adequate* procedures. As we have seen with Galileo, science is also about not letting theoretical and dogmatic concerns impact the evidence.

Throughout the report, the Galileo Commission lays out a roadmap to a wider idea of science. We need to have this conversation so that science is not limited by an outdated view of the nature of reality and consciousness. To address the challenges of the 21<sup>st</sup> century, science needs to be able to accommodate and explore significant human experiences and questions that science can't currently accommodate for philosophical reasons.

The mainstream scientific attitude is yet to evolve, even though there are already subdisciplines within science that have moved beyond the limitations outlined in the report. This is what this layman's guide is all about. Taking the existing research and making it easier for you, the reader, to understand the evidence that already exists for the expansion of science. Expanding the background assumptions of science means changing its culture. This will only happen through different and changed practices in science.

## THE EXISTING EVIDENCE BASE

Experiences of expanded consciousness are sometimes called mystical or spiritual experiences. Among the practices that can lead to these are meditation and mindfulness. Over the last few decades, these practices have started to break through into the scientific community. Other practices such as exploring the lived experience of individuals (phenomenological inquiry) alongside neuroscientific studies have gradually developed in their own niches, such as introspective or contemplative neuroscience.

Yet other phenomena, experiences and concepts of consciousness are actively excluded from science. Spiritual experiences are not taken seriously. They do not fit with the worldview that arises from science's implicit background assumptions. This leads science to assume that these experiences do not hold any valuable knowledge and information.

Sometimes spiritual experiences are considered "transcendent" and people think that this refers to "god" or

another deity. Science can say nothing about the existence or non-existence of such an ultimate reality, as the Nobel Prize-winning Austrian-Irish physicist, Erwin Schroedinger observed.

"Transcendent" refers to experiences of a reality that is non-material and beyond the visible physical environment. The higher mathematics of quantum physics is an example of transcendent concepts in science. These mathematical concepts refer to a deep structure of reality that we cannot imagine or locate in our everyday experience. The same deep structure of reality applies to spiritual experiences, which often refer/point to ideas such as "Tao", "Buddha-Nature", "Brahma", "Atman", "God", "Christ", "Spirit", "Mother", "Nature", "Absolute" and many others.

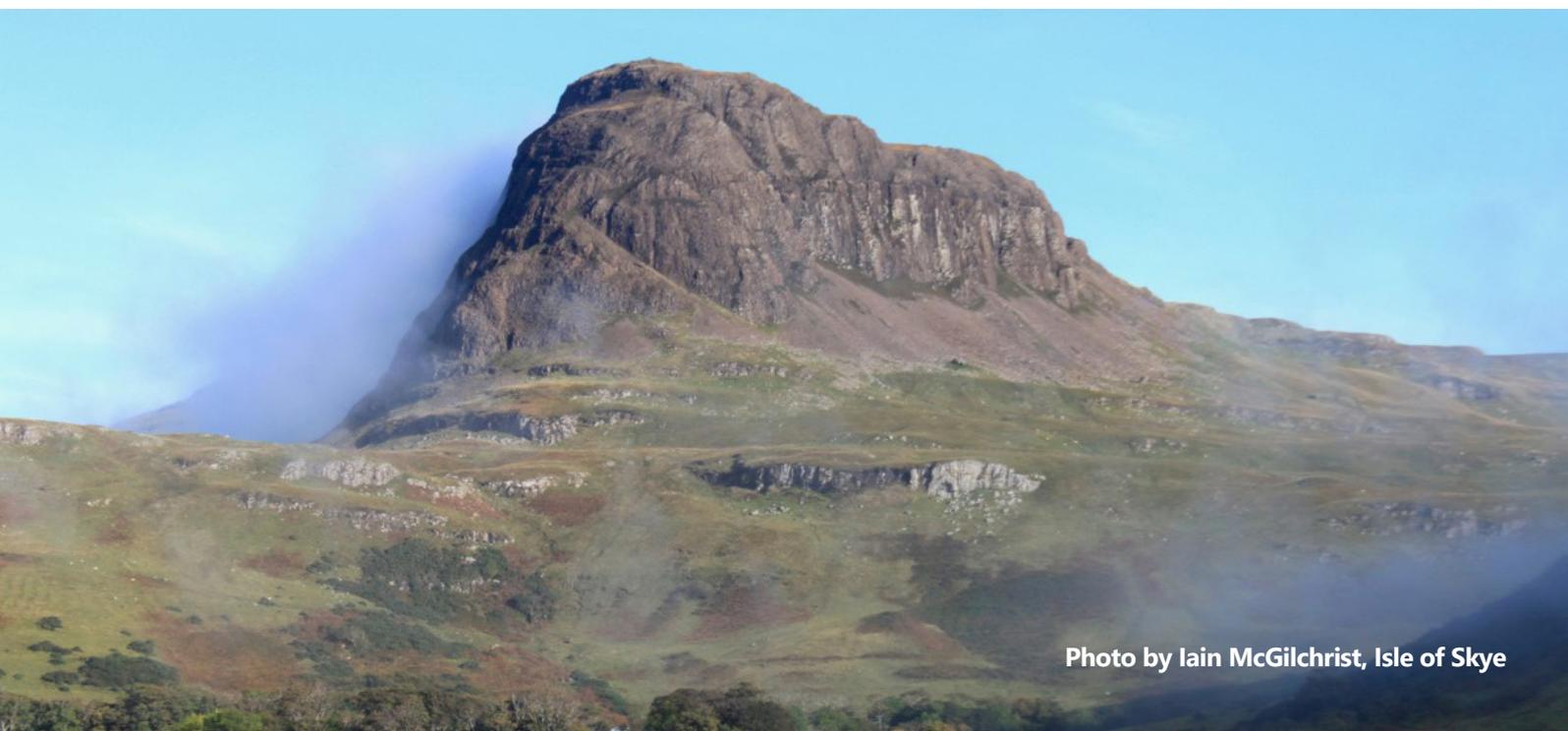
The interpretation of spiritual experiences belongs to the field of theology or religious studies and not to science. However, the fact is that people do have such experiences spontaneously. Understanding how they influence their lives and the extent to which they facilitate insight, knowledge and wisdom are meaningful questions. By being part of the scientific remit, we may be able to research them systemically and advance our understanding of the nature of reality.

A number of movements have separated the world of science and the world of religion in the Western world. The history is complicated, complex and hard to follow. Science was one of the major factors in driving the political enlightenment movements. It fought for freedom of thought and speech. The loss of power of the church led to a lack of engagement between theology and science. Our widespread culture of consumerism and economic materialism has reinforced the implicit material worldview that appears to be inherent in science.

Another implicit assumption is that to be a good scientist you need to be a materialist, atheist or agnostic. Yet the suspicion of religion *in* science is unwittingly creating a religion of science; "scientism". This thrives on the assumption that science has replaced religion and now has all the answers to all the questions we may have, or will have in the near future.

Within this framing, consciousness and spirituality have no place and become taboo. This is what this report disputes. Science must be free from dogmatism of *any* kind. The essence of science is free inquiry from a place of curiosity about our world. It is about having methods to question our own beliefs and assumptions and being able to discuss these rationally.

Good science can be done differently. It can come from a different and expanded set of assumptions. Much work has already been done on this, motivated by a vision: a vision of a broadened, more relevant and more encompassing science. One that serves all of humanity and not just particular interest groups. This is why the Scientific and Medical Network was created and has commissioned this report.



# CHAPTER ONE

## THE PROBLEM OF A MATERIALIST SCIENCE

*“There will always be considerable resistance to revising a paradigm, especially if it has proved successful in many respects.”*

~ Dr Iain McGilchrist

Any human intellectual activity, including science, has to make assumptions that are taken for granted and yet cannot be proven by the methods that activity uses. This is what the English philosopher, archaeologist and historian R.G. Collingwood called *absolute presuppositions*.

The majority of modern scientists possess a set of absolute presuppositions that they rarely question. Some of these are: When it comes to understanding what’s real in the universe, natural laws and forces are considered the norm. Matter is the fundamental component of reality. Everything in the universe emerges from the interaction of matter. Complex systems are understood through the parts that make them up, e.g. the different parts of the body. Knowledge can only be gained through the senses.

These assumptions, or absolute presuppositions, create a belief that consciousness is nothing more than an emergent phenomenon of brain activity. It is the way neurons fire in different parts of the brain that creates how we think, feel and experience the world as individuals. However, this belief is not proven by science nor is it justified by the emerging evidence.

There are a number of well documented empirical reports that challenge this belief. We have reports of near-death experiences (NDEs). Despite well documented absence of brain activity, people have experienced complex understanding, sensing, thinking and emotional responses. To support these experiences, there are a number of independent reports that confirm these experiences as separate from the body (non-local perception) and during near-death-states absent of brain activity. A series of meta-analyses conducted on the large database of parapsychological and anomalous cognition research supports the possibility of non-local perception. Additionally, there is another large database of children who remember previous lives, some who are born with birthmarks and physical issues that reflect the previous cause of death associated with the personality remembered.

More and more scientists are starting to look through the telescope and research these frontier areas using existing scientific methods. The empirically grounded conclusions they reach are challenging the absolute presuppositions of the majority of modern scientists. These scientists, many of whom contributed to the Galileo Report, argue that due to these conclusions, we need a model of consciousness that explores consciousness as a whole, beyond the parts of the body that are assumed to create it. It also needs to be studied as something fundamental to how we understand reality.

The minimum starting point for this model is to consider that both mind and matter, or consciousness and the brain, are two aspects of reality that cannot be simplified. Both aspects co-occur and offer differing perspectives on an underlying reality that we cannot access through just one or the other.

When we come from this dual aspect model of consciousness, we suggest that consciousness can access reality directly through the senses as classical empiricism suggests. However, consciousness can also access reality through our internal senses or a deep exploration of one’s own thoughts and feelings.

A model like this suggests there are different and valid routes to reality through consciousness that add to the perspective that classical science offers. Through certain conditions, we may have direct access to a

deeper understanding of reality that could provide key insights into ethics, meaning and values.

Information gathered from NDEs and other transformative experiences that challenge a mainstream scientific view have profound implications for how we live our lives. They suggest that we are all part of a larger field of consciousness and live in an interconnected world. If we integrate this wider view of consciousness into science, we would be able to create new methods and assumptions that underpin science.

The narrow materialist worldview is often passed on uncritically to young scientists by mainstream authorities. Not only is it offered as an adequate explanation of reality but also as a pre-condition for a successful scientific career. This report calls to all scientists to explore this topic openly and become more critically self-reflective of the absolute presuppositions on which modern science is based.

## EXPLORING THE MATERIALIST WORLDVIEW

Going deeper into the problems of a materialist worldview, modern science looks at the world in terms of material entities such as atoms, molecules and organisms. Everything else is split into other categories such as mythology, religion, fantasy or even the humanities. This split is so persuasive that there is little room for flexibility of thought. The spiritual experiences already mentioned in the introduction are an example.

Other examples that science currently neglects or marginalises are meaning, values and all types of inner conscious experiences. While these topics are mentioned in psychology, they are considered individual constructs and not potentially objective constructs of the world. If meaning and values are merely constructions, then values cannot exist independently of the mind and the idea that actions are either good or bad is nothing more than fiction.

This then places ethics and values at the mercy of political and social consensus seeking. What is considered right or wrong is only what the majority have agreed. Because of the split within our current scientific worldview, we lack the methodology to explore whether meaning and values are really part of our world or simply created through social negotiation.

The challenge that emerges from some of these spiritual experiences is that they call into question the current materialist worldview. An experience of one-ness with nature, amongst others, requires us to explore the assumption that the material and non-material aspects of the world are in fact separate. This assumption is at the root of scientific experimental methodology and has implications for how science is conducted.

A broadening of the scope and remit around consciousness and spirituality is required within science. This will not be the only thing needed within science. However, integrating consciousness into the scientific agenda offers us an opportunity to remove the power of the unconscious link to philosophical and ideological materialism. Doing so will allow us to create a more diverse culture, a more inventive type of science, and more encompassing methodologies. These will help us address a number of existing problems within science to find better answers than currently exist.

Two key concepts that impact the current materialist worldview and contribute to these problems are the Cartesian and Heisenberg cuts. The Cartesian cut is the split between conscious events that exist "inside" us and material events that are "out there". The Heisenberg cut is the split that an experimenter or scientist makes between what he or she considers important enough to study and what exists in the rest of the world, including him- or herself.

This is not necessarily bad. It is the way that any perception, thought or concept helps to place the wholeness of the world into compartments so that we can understand it better. This only becomes a problem when we forget that we are doing this and think that it is the only way of looking at the world. When our so-called 'scientific worldview' does this it labels certain things as real and certain things as imaginary, or "only in the mind". This contributes to many crises that science is currently facing.

## THE REPLICATION CRISIS

Within psychology and medicine, there is a challenge to replicate results. In 2015, The Open Science Collaboration found that only 39% of 100 mainstream psychological research findings could be replicated successfully by competent and well-trained researchers. Only 47% of the replicated effect sizes were within the confidence limits of the original ones. Included in the sample were mainstream examples of successful cognitive, social and experimental psychology. This highlights a severe lack of robustness.

This same issue can be observed in medical studies. When the Cochrane Collaboration did systematic reviews and meta-analyses of clinical studies clear results were only demonstrated in 10% of cases. Half of the remaining review benefits were unproven and the rest needed further research. Some examples of where this issue emerges is in the claims regarding medication against bird flu, anti-depressants, and the prevention of cervical cancer through vaccination against human papilloma virus.

Some of these issues may be down to bias and conflict of interest that is pervasive in much of medical science. Sloppy science is another cause, which may be remedied by more stringent application of already applied and known methods, pre-registering experiments and more solid reporting.

However, the materialist worldview assumption that we can separate research both from the researcher and also from the context in which it is carried out also plays a role. Many sub-branches in complexity sciences, systems biology and systems thinking are starting to realise that the idea of separateness and separability are only partially valid in complex systems. From this perspective replication becomes a more fluid, context-dependent concept and "effects" become more context dependent and relative within a whole network of meaning. A scientific example is quantum entanglement, which highlights a connection between particles that exists beyond time and space.

Yet medical researchers still seek "the true" effect of a medication, without an understanding of the side-effects it causes. Psychotherapeutic researchers still seek to determine "the" effectiveness of a particular psychotherapy. Biological researchers still seek to isolate the effect of a specific enzyme.



Jiddu Krishnamurti (1895-1986)  
Professor David Bohm FRS (1917-1992)

## THE ECOLOGICAL CRISIS

Various ecosystems are on the brink of collapse. Global warming is impacting the climate system. Decreasing numbers of insects, reduction of biological diversity, and the strain of overfishing on the marine ecosystem are impacting the food chain of some animals. When we factor these ecological aspects into our economic system, calculations show that we are on a global decline, as explained by Sir David Attenborough in his new film 'A Life on our Planet'.

Some people argue that more science and rationality underpinned by a materialist worldview is needed to solve this. Others disagree. This creates a controversy that demonstrates the inconsistencies that exist within the current scientific model. Taking apart complex systems like the ones mentioned and analysing them in terms of their parts requires and supports compartmentalised thinking. This is part of the previous idea of separateness and separability. This thinking allows for one type of logic to dominate. For example, the economic logic of profit can dominate over the logic of ecological interdependence.

Climate science is highly interconnected. It uses complexity theory and systems thinking to create a different way of viewing our ecological crisis. This science calls to credible, urgent action that comes from advanced science. However, it takes a long time before scientific advances actually change political and economic culture. What we are currently seeing in our changing climate are the effects of accumulated short-sightedness of a materialist worldview that has expanded to inform politics and economics 'mistakes and errors of judgement, as Attenborough puts it.

When this happens, science can be used in the service of ideology. An example of this is the ideology of the Western political model used to debate robust scientific findings. The same strategies and results are seen in looking at the scientific debate on the health hazards of tobacco, acid rain, nuclear waste and global warming. Well informed detractors are employed to debate robust findings, using the logic of freedom, economy and individual choice over the logic of scientific discovery.

This is only possible because a certain understanding of "science" makes an ideology more important than scientific findings. This can be used to sow doubts against scientific results in service of religious or political ideology as well as in service to a materialist, supposedly "scientific" world model. When this happens, it is science itself that is at stake and at risk.

## THE CRISIS OF CREDIBILITY

Much of the two previous crises have led some sectors of the public to become sceptical of the findings and authority of science. Mainstream politics is still largely supportive of science and its role in society. However, some politicians in all countries attack the lack of credibility of 'the establishment' in politics and economy through science itself. By picking out the failures of and within science, it becomes easy to discredit the political and economic decisions because of the science behind them.

If science were able to establish mechanisms of self-reflecting and critically examining its own foundational assumptions, perhaps this wouldn't be so easy to do. A more encompassing and more relevant science will also be more understood and accepted. This will make it less vulnerable to attacks from vested interests.

## THE CRISIS OF MEANING

In *Man's Search for Meaning*, Victor Frankl highlighted that modern people in the West often suffer from a lack of meaning in their lives. One reason seems to be that our modern worldview has not only disenchanting the world but narrowed our understanding of worthwhile goals. Advertising and public opinion seem to value the material and mundane. Get a well-paid job. Live in a nice house. Find a career with the chance to increase your power and income. Ignore the long working hours, lack of rest, multi-tasking and sacrificing intimate relationships. Don't acknowledge the burn-out and depression that comes from focusing on this.

When we believe that no knowledge can be gained from outside science and its methods, we deepen this crisis. Meaning is *not found* in the material world and our knowledge of it. Meaning is not something we can create like money or wealth. We either find meaning - it reveals itself- or we do not have it. Medical science and psychology can analyse and document the consequences of a lack of meaning in people's lives and how it influences mental and physical processes within the brain and body. However, it cannot remedy a situation due to a lack of meaning.

Using drugs to solve a crisis of meaning is mostly an illusion and at worst bad propaganda. There are a number of research findings into natural or artificial psychedelics that show how the deep insights and meaning arising from these experiences can help cure mental and physical problems. What's interesting is that these experiences are very similar to spiritual experiences and generally go beyond the scientific assumption that everything that exists comes from the interaction of matter.

Our current science can highlight what is important for people but cannot help create or guarantee this. Meaning is a gift we receive through consciousness and as an act of consciousness. Without meaning, the cohesion of our societies is missing and egotistical pleasure replaces meaning and takes priority.

## THE CRISIS OF HEALTH

Research shows education, social support and relationships, as well as a fulfilled life, are the most important protective factors against disease, early mortality and suffering. A lack of meaning in people's lives creates the risk of burn-out, depression and anxiety. While some people think that levels of depression and mental disease are stable, a wealth of global epidemiological data contradicts this. The World Health Organisation (WHO) projects depression to be the second most important disabling disease worldwide from 2020 onwards. This is on the rise at more than 5% per year worldwide. The same applies to other psychological disorders such as alcoholism and anxiety disorders. These problems are likely an indirect reflection on the lack of meaning and a focus on material wealth and social prestige.

Improved hygiene and living conditions reduce premature death due to childhood and maternal mortality. Yet bacterial resistance is starting to become problematic. This resistance is driven by the preventative application of antibiotics in mass-animal food production. Liberal prescription of antibiotics for minor health problems also plays a role. This is another example of compartmentalised thinking that doesn't consider the wider network of interdependencies.

Overall mortality due to cancer is stagnant or declining yet the incidence of new cancer cases is increasing. Better healthcare and improved diagnostic facilities contribute to this as does direct or indirect consequences of lifestyle and scientific progress from our existing worldview. For instance, research shows the increase in black skin cancer comes from the thinning of the ozone layer created by fluoride-carbon-hydrogen combinations. Despite the Montreal Protocol banning these in 1987 we are still suffering the consequences today. The invention of cooling devices due to progress in chemical knowledge led to problems in other areas. Economic logic dictated the outcome until rationality prevailed and changes were made.

This example highlights how the separate logic of invention and technical progress can not only infringe on our health but also on the complexity of our ecosystems. It also highlights the long-term impact of actions and is the only example where concerted action has reversed a potentially dangerous trend. We cannot ignore that this is likely due to the fact that economically viable alternatives have been found to replace fluoride-carbon-hydrogenates. If the scientific mainstream aligns with powerful economic interests then dissenting voices in both health and ecology have no chance of being heard, as we are witnessing with the Covid-19 narrative.

Cancers are on the rise. It is likely that this is not only a natural trend but directly caused through a complex mix of causes from our modern, scientifically informed way of living. Intensive farming with the wide use of herbicides and pesticides, changes in food preparation and processed foods all play a role, as do many other yet unknown factors.

## THE NEED FOR SCIENCE WITHOUT ABSOLUTES

All these crises have at their root science operating in compartmentalised thinking. Breaking down complex problems into specialised fields ignores a broader perspective that consciousness can help with. Ethics and solid methodology are not enough to safeguard science against the danger of compartmentalisation and neglect of background assumptions.

It is important to note that when we integrate consciousness into the scientific agenda, we are not arguing for answers to ultimate questions. This type of science remains open and undecided. It is not up to science to state that God exists or does not. The same goes for spiritual entities, consciousness continuing after death, spiritual realms, moral responsibility and what the ultimate reality actually is. In this spirit, science with consciousness remains agnostic as originally defined in 1892 by T.H. Huxley, an English biologist and anthropologist:

*“Agnosticism, in fact, is not a creed, but a method, the essence of which lies in the rigours application of a single principle... ‘Try all things, hold fast by that which is good.’ It is the foundation of the Reformation, which simply illustrated that the aim that every man should give a reason for the faith that is in him...In matters of intellect follow your reason as far as it will take you without regard to any other consideration...That I take to be the agnostic faith.”*

Science must not be dependent on any type of religious or other ideology. This is a necessary moral requirement for science. For the time being, there is no such thing as a scientific discovery of moral absolutes. Neither is there a scientific discovery of the absence of moral absolutes, spiritual entities, God, or purpose because they have never been part of the scientific remit.

It is possible that these topics will never be part of a scientific remit. However, it is a gross misunderstanding and part of the foundation myth of scientism to assume that science has actively disproved and dismissed these ultimate questions and entities.

By challenging this scientific creed, and by insisting that openness is part of the necessary virtues of both a scientist and spiritual seeker, we identify a common ground upon which science and spirituality can work together. When we combine science and spirituality, we enhance the strengths of both and balance their respective weaknesses. This allows us to be even more critical of ideas presented as fact without solid reason. Throughout this report, we provide a roadmap that unites science and spirituality as well as the reasons why this is important.

## QUESTIONS FOR REFLECTION

- What absolute presuppositions do you have about science?
- How do these impact the way you think about some of the current crises that are caused by a materialist worldview?
- What do you think about the possibility of uniting science and spirituality?

# CHAPTER TWO

## THE NEED TO EXPLORE BACKGROUND ASSUMPTIONS

*“The scientific establishment makes unscientific assumptions, an inconsistency ignored by the mainstream who assume that they make no assumptions.”*

~ Dr Iain McGilchrist

Kurt Gödel is considered to be one of the most significant logicians in history alongside Aristotle. His work had a huge impact upon 20<sup>th</sup> century scientific and philosophical thinking. One of his key pieces of work is known as the incompleteness theorem. What this theorem did was to prove mathematically and logically that it is not possible to construct a system that can prove its own foundations.

This incompleteness theorem is a similar idea to Collingwood’s idea of absolute presuppositions, i.e. science holds a number of largely unconscious and largely unchallenged ideas that create its foundation and cannot be proven by scientific methodology.

Collingwood’s work on absolute presuppositions was developed further by Thomas S. Kuhn into his notion of “paradigm”. Kuhn is considered one of, if not the, most influential scientific philosophers in the 20<sup>th</sup> century. His book on paradigms, *The Structure of Scientific Revolutions*, is one of the most referenced academic books of all times.

In the book, Kuhn argues that science consists of periods of normality where there is cumulative progress that are interrupted by periods of revolutionary science. When “anomalies” are discovered, new paradigms emerge to ask new questions of old data that changes the rules of the paradigm. We can see this within the work of Galileo identified in the introduction.

What the work of Gödel, Collingwood and Kuhn highlights is that background assumptions are powerful and inescapable. Background assumptions define how activities such as science are structured, understood and socially negotiated.

It is essential for all science, and all perspectives within science, to reflect on the assumptions that underpin the work it does. When we do, we become conscious of these assumptions and how they influence our imagination and actions. This allows us to see how our current scientific culture - and culture at large - has created the language, concepts, methods and limitations of the way in which it works.

## THINKING ABOUT BACKGROUND ASSUMPTIONS

One of the easiest ways to understand how assumptions work is to go back in history. When we do this, we step into a place where other background assumptions were at work that we may no longer be familiar today. We also step into completely different cultures where our background assumptions don’t fit. This helps us understand better the power, grip and mechanisms of our assumptions and world model.

In the middle of the 13<sup>th</sup> century there were a number of scholars who called themselves “the modern ones (moderni)”. This was a way of distinguishing themselves from their predecessors or supposedly old-fashioned rivals. The “modern ones” read Aristotle. They worked hard to interpret Aristotle in accordance with the traditional teachings of the Church and the Platonist philosophy that existed in the Augustinian tradition. Saint Augustine was a North African theologian and philosopher who lived in the 4<sup>th</sup> century. The old-fashioned scholars didn’t think Aristotle was relevant and placed more importance on solid biblical scholarship and knowledge of the tradition.

Both factions of scholars would use clear logical argument along with a thorough knowledge of biblical and early Christian texts to create argumentative structures that are admirable to see, even 700 years later. Anyone who has a background knowledge of the texts and topics would see these debates as a prime example of logic and consequential thinking. The conclusions that both factions arrive at are only valid in the context of their background assumptions.

If you think about the world we live in today, the idea of scholarly debate about how many angels might be sitting on a pinhead is absurd. To be able to have that debate you first have to accept the reality of spiritual beings like angels and understand how scholars at that time defined "spiritual matter." If you don't share those ideas, it sounds silly.

Think back to Galileo. The work of Aristotle and the beliefs of the church were what placed the Earth at the centre of the universe. There had been 400 years of debates filled with these background assumptions that Galileo's work challenged.

A second way of challenging our own presuppositions is to imagine yourself one hundred years in the future. The replication crisis of science is resolved. We have identified new scientific ways of solving our ecological crisis that seem to be working. Science is respected by all. People find meaning in their lives and there are scientific approaches that help them to create this. Depression and other psychological disorders have decreased. Cancers and other big killer diseases are disappearing from our world. What assumptions would need to be in place in our society now to create this future? How would future scientists look back on our own current way of doing science?

The third way of exploring our background assumptions is by going into a completely different culture as anthropologists or ethnographers do. When we enter another culture, we find people who clearly and without questioning see the world in a certain way that is normally quite different to ours. In the world of an Indian of the Amazonas, plants have spirits just like animals and people. Animals can be inhabited by the spirits of people and vice versa. Dying people's spirits move into another realm from where they can come back. The spiritual leaders, known as 'shamans', enter ritually induced altered states of consciousness that enable them to commune with these spirits; to gain knowledge, avert danger and report distant events. It's even possible for two participants in a ritual to have a shared vision of the same spirit guide.

It is natural for them to experience all of this. There are no questions asked. It is only when we, coming from another culture and with other background assumptions, start asking questions. Are these spirits "seen" and "experienced" in visionary states real or "only" imagined? Where does the information come from? Why can two people have identical visions? Is this useful? If so, how?

The indigenous knowledge implicit within the Ayahuasca ritual is stunning. Developed many thousands of years ago, Ayahuasca is made from two different plants, *banisteropsis caapi* and *psychotria viridis*. These plants grow in two different areas and are not obvious candidates for a medicinally active drug combination. When asked about how the Indians would know to combine the two plants, they would say: "The plants told us."

Modern analysis has shown that the ingredients of one plant help to make the ingredients of the other plant stay in our system longer. One of the ingredients is dimethyltryptamine (DMT) which is a precursor to serotonin in the body. Serotonin is sometimes called the happy chemical because of its impact on wellbeing and happiness. The Ayahuasca ritual impacts this chemical amongst others. It is highly unlikely that the Indians of the Amazonas figured this out by pure chance because there are millions of potential plant combinations, many of which will be poisonous.

Generally, when we think about other cultures, we are prone to assume that ours is the "correct" way of doing things, or the "better" way of gaining knowledge. However, the Ayahuasca ritual shows it is possible to recognise the value of different ways of doing things and gaining knowledge. When we adopt different assumptions about what is real and what methods we use, we may arrive at different results.

## BACKGROUND ASSUMPTIONS ABOUT THE HEART

History is littered with examples where background assumptions have limited what we can actually see. This impacts what we experience and defines what our world contains. It also states what is considered non-existent, irrelevant or impossible.

Our modern understanding of the heart knows that it beats to pump blood around the body. Yet back in the 17<sup>th</sup> century, it was commonly accepted that the heart was a convection heater that circulated blood around the body by warming it. The brain cooled the blood and it flowed down to the lower parts of the body. It was then transported back to the heart by a temperature gradient.

William Harvey was an English physician who was the first person to describe completely and in detail how the heart pumped blood around the body. Vivisectioning dogs and other animals, he was able to observe a beating heart. It was this observation that led to his discovery. (Notice the background assumptions you may have about how he arrived at his conclusion!)

Yet when Harvey published this finding around 1623, there was an outcry about this outrageous new finding. One of the leading philosophers and medical doctors of the time, Emilio Parisano wrote: *"We deaf people cannot hear the heart's beat, and there is no one in Venice who can. If he can hear it in London, lucky him, but we are writing in Venice."*

## HOW BACKGROUND ASSUMPTIONS OPERATE

Throughout this chapter, we've shared examples of background assumptions, or absolute presuppositions, in action. They all have a number of things in common:

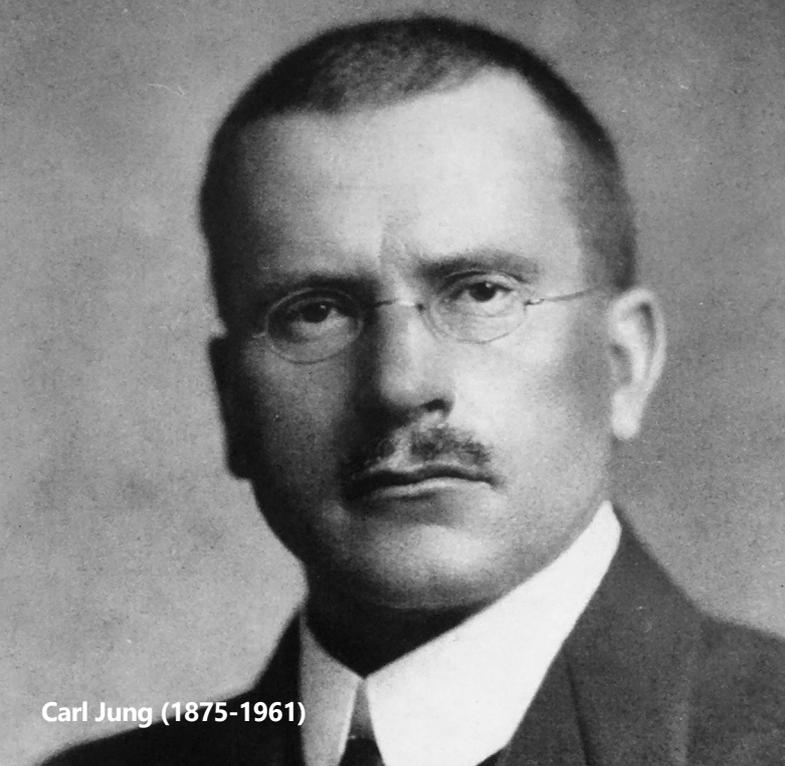
- They suggest a framework of what to expect and what not to expect
- They guide our understanding, our activity and our thinking
- They split the world into what is relevant for us and what isn't so we ignore the full, rich network of possibilities and realities
- They help us to find and discover things we have been looking for, expecting or hoping for
- They hinder us by making it more likely that we overlook things that are obvious under different assumptions and anything that is not the focus of our model or expectation irrelevant

If scientists and other people think they are *only* relying on science, scientific discoveries and theories they are actually lying to themselves and the public. Scientists also need to rely on assumptions about the world, assumptions about the right methodology and assumptions about what is valuable and what isn't. A gold-washer who does not know what to look for and what gold looks like will never find it. A scientist who does not know what to look for and what science looks like will never practise it.

When we are conscious of our assumptions and understand where they come from, we can be open to changing them. Evidence, phenomena or data that contradict or are incompatible with our background assumptions offers an opportunity to redefine our assumptions. To do so is what is required of an enlightened, open, curious and therefore scientifically proper attitude.

Otherwise we remain unaware of the background assumptions and think that this is just how science works. To adopt an approach like this is actually using scientific background assumptions as articles of faith. In this way, science then becomes a new religion.

That so many people subscribe to science as a religion, even if unconsciously and sloppily, reflects our human condition. We are unable to operate without such basic assumptions about the world, human nature, absolute realities and other big questions. While science has solved some questions and offered potential



Carl Jung (1875-1961)



Wolfgang Pauli FRS, Nobel laureate (1900-1958)

answers to others, there is a longer list of unsolved questions.

Once we start exploring this list, we discover there is still a very long list of puzzles, inconsistencies and contradictions. This is true even of questions that we think science has solved. Some of these include the cosmological question as to how our universe came into being, how life arose out of the primordial soup of elements and exactly how evolution proceeds.

However, because some questions have been answered and some puzzles solved by science there is the *promise* of future solutions to others. Technology developed by science offers help and comfort to make our daily lives easier. Yet if we believe that science will eventually have an answer to all the outstanding questions then we turn its background assumptions into articles of faith.

The essence of faith is hope in some as yet absent fulfilment. It is at the base of any kind of religion. Faith in Jesus Christ is the essence of the Christian Creed. Faith in the presence of Jahweh is at the core of Jewish religion. Faith in Allah is at the base of Islam. Faith in the truth of Dharma is at the core of Buddhism. When a scientist believes in the future superiority and universality of the current scientific approach, they do not practise science but profess a creed.

To operate from a genuinely scientific stance means that we have to be conscious of the basic assumptions we are making. We need to understand them in terms of their historical, political and cultural context. When new evidence and data emerge, we have to be ready to change our background assumptions instead of holding onto them. This is the very essence of what it means to be a scientist instead of espousing scientism.

As the work of Kurt Gödel showed, we cannot prove the validity of science by its existing assumptions. In this way, science dances a fine line against religion. We need assumptions that we can and will never be able to prove in order to practise science. However, it is when we treat those assumptions as untouchable and non-negotiable that we create a religion. There is nothing wrong with having faith in science. We simply need to be aware of our faith and able to justify it.

We will explore the most important and powerful assumptions of modern science fully in the next chapter. What is key to understand is that these background assumptions can get mixed up with the business of doing science.

A scientist can be scientifically active and part of the scientific community without necessarily subscribing to all or some of the background assumptions. In fact, a scientist can subscribe to a different set of assumptions. This is possible when we recognise the difference in scientific method and worldview.

## SCIENCE 1: METHODOLOGY

What we are calling Science 1 works on methodological principles that are shared and consensually agreed upon. While it is related to the scientific worldview, the methodology can be applied to a number of problems and questions, even those that are critical of a Science 2 worldview which is based on assumptions that may or may not be true. It refers to how science is actually done. This involves the methods used to establish findings, what is considered successful or sufficient and how findings are accepted as fact or in need of further support.

A materialist, a Hindu, a Buddhist, a fundamental Christian, a Catholic or a Muslim can all use the same methodology of a randomised controlled clinical trial. It can be applied to study a new pharmacological agent, an old herbal preparation or even acupuncture. The same goes for astronomers of different ideological backgrounds. As long as they are well trained, they should be able to see the same astronomical entities through telescopes. The religion and worldview of a laboratory worker does not make a difference on the presence of an antigen in an immunological test.

## SCIENCE 2: WORLDVIEW

Science 2 refers to the background assumptions that exist within scientific culture. We've already established that these assumptions are linked to materialism. These assumptions, as this chapter has highlighted, shape how we see the world, what role science plays and what is likely real. In essence it is a belief system. When tightly held and strongly emphasised, it becomes more of an ideology or religion than science.

However, as this chapter has also highlighted, we can reflect on our background assumptions and explore how they help or hinder us. When we do question our background assumptions, it enables us to enlarge or alter our background assumptions. This would allow Science 2 to transition to a more expanded Science 3 that has a worldview which includes the existing research that is currently ignored. As this happens, Science 1 will also expand as a wider methodology is created.

Science 2 assumes that consciousness only emerges from brain processes. Expanding Science 2 allows us to assume that consciousness might have its own access route to reality via contemplative, meditative or introspective procedures. From this we can create new methodologies that were not part of the existing scientific methodologies, even though they are part of indigenous or spiritual cultures.

Sometimes a newly invented methodology or discovery in Science 1 can also change Science 2. Insights from the field of psycho-neuro-immunology and endocrinology helped us to understand how the immune system impacts psychological experience of stress and vice versa. This methodologically solid research challenges existing assumptions within Science 2 about how the body works.

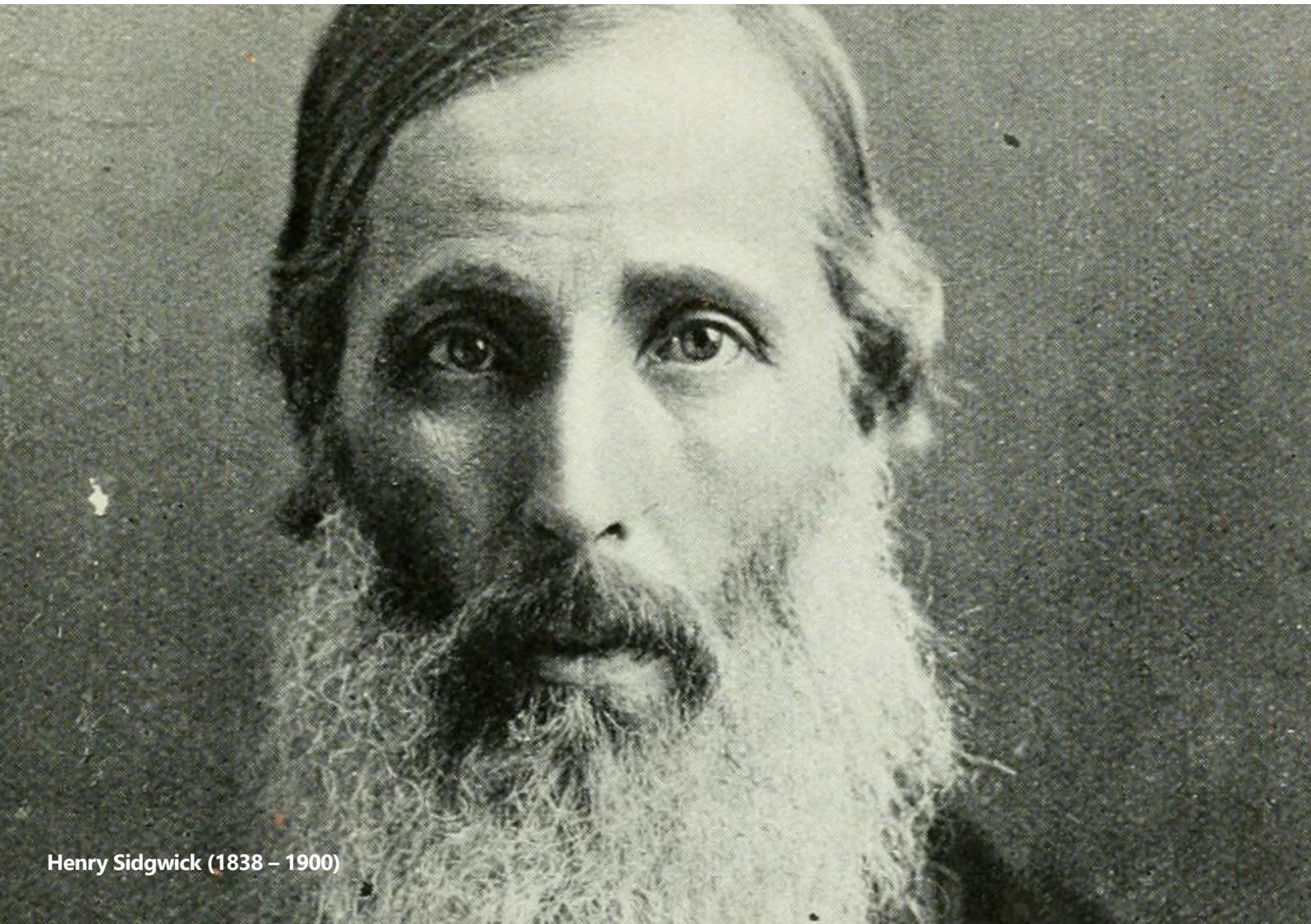
However, scientific findings take some years until they are known among all specialists of the fields. It takes even longer for them to filter through to the rest of the members of the discipline. By the time the scientific community as a whole takes note and these findings inform our way of living, the research can be decades old. Science 2 is slow to adapt to new findings, likely because the assumptions it holds are unconscious.

This is not a bad thing as some scientific findings turn out to be wrong, irrelevant or understandable by other means after a while. What we wish to highlight is that the background assumptions of Science 2 are mistakenly taken to be the same as the methodology of Science 1.

When Science 2 is not explicitly reflected upon then it causes modern scientists to make unjustified assumptions. An example of this is the way Parisano ridiculed Harvey's discovery of the heart as a pump. When assumptions are not questioned, they become beliefs.

## QUESTIONS FOR REFLECTION

- Think of a time you were exposed to a culture different to your own. What did you learn that challenged your understanding of the world?
- What do you think about the possibility of science being a new religion?
- How does thinking about science in terms of Science 1 methodology and Science 2 worldview change your understanding of what science is?



Henry Sidgwick (1838 – 1900)

# CHAPTER THREE

## KEY ASSUMPTIONS OF MODERN SCIENCE

*“We need to ask the difficult, truly scientific questions, allowing people to see what they may be missing by being too narrow in their assumptions.”*

~ Dr Iain McGilchrist

The assumptions that we are about to explore are neither true nor false. This is the difference between our postmodern times and earlier ideas of science and philosophy. When you look back at the history of philosophy, most of the debate was about the truth or falsehood of the basic assumptions of reality. History shows us that this debate is not solvable. We cannot overcome the language we use and the concepts we deal with. All we can do is explore what consequences they allow. We can discover what horizons they open and close and what methods they entail. It is this exploration that allows us to debate the usefulness of any set of scientific assumptions.

There are three ways of looking at the set of background assumptions that make up our modern, scientifically informed mindset. The first is through its materialist ontology, which states that matter is the ultimate reality in the universe. The second is through its naturalistic outlook, which expects that science will eventually be able to understand and explain all of reality in this way. The third is through its empiricist methodology, which states that the way to explore reality is through two generic types of experience: observation and experimentation.

Observation is the method of astronomy and many other more observational sciences such as geology. It is also widely used in social science research surveys. Put simply, it means to explore the world through our senses, ideally through repeated observations. Experimentation means that we are actively interfering with systems. We create a set of conditions and observe what happens within the system after we have intervened. This gives us the benefit of control and creating the right experimental conditions.

Observation and experimentation complement each other. We see this in medicine, psychology and biology. Findings from field studies or natural observation studies give us different types of knowledge than laboratory, clinical randomised experiments or experiments in artificial circumstances.

These experiences need to be structured by theories. Analytical strategies are an essential part of the methodology. Logical analysis, statistical-mathematical modelling and the analysis of consistency of observations with theoretical expectations are all part of these methods. As a rule, observation and experimentation address the outer, material aspects of reality. If you question what other aspects of the world there are to study, you encounter an absolute presupposition or background assumption.

Another important assumption is naturalism, the outlook that expects all scientific discoveries to reveal that everything in the world is part of the natural order. The first wave of naturalism emerged from combining Aristotelian philosophy with Christian doctrine. This is the naturalism that was in existence when Galileo looked through his telescope. The second wave emerged during the Victorian times. This attempted to secure the teachings of science over religious creeds. Underneath it was sure that science would reveal a more enlightened type of religion. While this modern naturalism is part of the Science 2 worldview, it is not necessarily linked to the idea that only matter exists in the universe. It only assumes that everything will be eventually explained by adequate scientific theories.

Throughout the rest of this chapter, we will explore the deeper implications of these assumptions. This will allow us to move into highlighting what is limiting, missing and wrong with these background assumptions in the following chapter.

## “THE WORLD CAN BE REDUCED TO MATTER”

As we've already mentioned, the mainstream idea of science is that the only thing worth studying is matter. This assumption of Science 2 worldview creates problems in Science 1 methodology. These problems are known as ontological and methodological reductionism.

Lightning was once thought to be the expression of the wrath of gods. It is now understood as a particular form of electricity; understood to be one aspect of electromagnetism; understood as one of the four fundamental forces of nature that works using photons. What modern scientists are hoping to find is a fundamental theory that will explain the interactions of forces and photons to simple interactions of matter and energy.

Ontological reductionism means that the complexity of lightning is reduced to the simplicity of electricity. Yet there is a contradiction within this analysis. At the heart of material reality lies information. Mathematical structures are needed to describe them. These structures are non-material in origin which challenges the idea that only matter can be studied.

Methodological reductionism means we use a supposedly more relevant method to understand the results that have come from a more complex method. In biological psychiatry, the first-person experience of psychiatric disorders can be reduced. It is simply biochemical interactions of transmitter molecules and receptors in the brain.

There are a number of diverse scientific approaches that have gone beyond this. Some approaches in social science, ecology, medicine and biology use complexity theory, systems thinking and interdependence analysis. Yet the majority of mainstream science still operates as if matter is all that matters.

Systemic therapeutic approaches have existed for a long time. Yet they are only becoming accepted in Germany now. In the UK, the main approach is cognitive behavioural therapy and consulting. The first chair for systemic psychotherapy and research was created in a German university in 2020. In the medical practice there is still very little evidence of systems thinking and practice, even though it has been advocated for the last 50 years.

The Science 2 worldview holds strong even with the evidence we will present on consciousness in Chapter Four. What this evidence shows is that Science 1 methodology goes beyond the Science 2 worldview. Background assumptions are assumed to be true because of the social pressures such as consensus, group psychology and belonging. As social beings we want to belong, be accepted and valued. We subscribe to the values and the rules of the group we want to belong to. Part of these values are the scientific assumptions.

These background assumptions have proved useful. Physics, chemistry, biology, biochemistry, medicine and even psychology have benefited from them. By developing simpler models, science has arrived at important insights about genetics, epigenetics, biochemistry and other fields. Yet they cannot explain everything.

## “THE SIMPLEST EXPLANATION IS RIGHT”

Science's tendency to develop simpler models comes from the work of William of Ockham, a medieval Franciscan philosopher and theologian. William argued that *"quia pluralitas non est ponenda sine necessitate* – for a plurality [of entities] should not be posited without necessity."

This is known as "Ockham's Razor" or the principle of parsimony. It stipulates that we should not invent entities or theoretical concepts if we can achieve the same goal of explanation and understanding with fewer concepts and entities. What's not understood by most scientists who use this principle is that William never gave a clear rationale for it, simply stating that it is "obvious".

While this principle has value, it can often be used in service of background assumptions. However, it is not a scientific law. It is only a well-accepted principle and needs to be viewed as such. When science attempts to reduce the richness of first-person experience to physical impulses it should not be used.

## “LOGICAL AND ANALYTICAL THINKING IS BEST”

The generic style of Western scientific thinking and theoretical analysis uses binary logic. This logic and thinking comes from Aristotle. Either something is or it is not. It is raining or not. An observation is true or not. Aristotle introduced this principle in “*Metaphysics*” as something that cannot, in the same way, at the same place, and at the same time be and not be. He was quite clear that this principle, and all of his other principles of logic, only applied to *sentences* and not to *reality* as such.

Our modern culture makes the mistake of applying this binary logic to reality. We fail to see that our sentences and our statements about our experience and observations determine the structure we are able to see and express. This deprives our world of life. We start to see the world only through what we can say about it in terms of scientific logic. Love may be a rush of hectic chemical activity in some of the brain centres. It is also much more when we look at the first-person experience of it. Anyone who has been in or is in love knows this.

At the start of each chapter there is a quote by psychiatrist, writer and Oxford scholar, Dr Iain McGilchrist. In his book, *The Master and his Emissary*, McGilchrist creates a strong argument about the way binary logic is not challenged in modern science. He does this by integrating robust neuroscientific knowledge about the split in our brain hemispheres and how they function with a cultural and philosophical argument.

Our left hemisphere – this is for right-handed people – is normally the dominant one. It is capable of language, identifying things and concepts with words, and operates in a sequential and logical mode. These are the sort of activities that are necessary for scientific understanding. For the last 400 years, our cultural and educational development has led to an increasing dominance of left hemisphere logical-analytical language in our Western world.

What is key to McGilchrist’s point is that this is only part of reality and half of the truth. The more important activity comes from the right hemisphere which is non-dominant in right-handed people. Its task is mainly pattern analysis. It creates connection between an experienced event in the present with the past and in different contexts. It is also important for meaningful connections between events and things with our sense of self. This right hemispheric model also helps us to see and appreciate beauty and form. It gives us a sense of who we are, what we want to achieve and how our environment is part of this. The right hemisphere is our experiential mode.

It is highly active in all artistic activities such as music, painting and any form of creative expression. Our “hunches” or intuitive insight about a situation or person comes from the right hemisphere of the brain too. We draw on a lot of implicit information, experiences and memories that we are unable to name or consciously express because of the way the right hemisphere processes them. It has no language in the usual sense. Instead it expresses itself through music, singing, dancing, rhythm and patterns. This is why it has to present the results of its analysis to the left hemisphere which then applies its capability of naming and analysing to it. The “hunch” receives a label without being able to give a reason why.

In evolutionary terms this pattern analytical capability of the right hemisphere is extremely important. It relates distinct and separate elements of experience with our concept of self. Intuitive knowledge, creative invention and action are stored here. The connections it makes are very fast and reliable. As the right hemisphere works in images and metaphors, it summarises all we have learned and know about this world and our concept of self. The downside is that we cannot explain these impulses and instead call them a “gut feeling”.

The right hemisphere with its quick yet speechless, holistic analysis needs the left hemisphere to translate the results of this analysis into language and concepts. In that sense the right hemisphere is the master – as McGilchrist’s title suggests – because it is more efficient and in terms of survival more important. The left hemisphere is the emissary, the speaker and interpreter. There is a rapid and continuous exchange of information between the hemispheres. Hardly anything we do is just relegated to one hemisphere.

We see a similar structure in the 1st book of Moses. Moses experiences the presence of JHWE in the burning bush. When he agrees to the mission to lead the people of Israel out of Egypt, he demands his brother Aron is his “speaker” and “interpreter”. This basis structure is already enshrined in one of our culture’s oldest texts.

The experiencer needs an interpreter. The interpreter is not the experiencer.

Yet our right-brain mode has been side-lined in favour of our left-brain mode of logical analysis and verbal domination. Our unconscious, meaning making, imaginary style of thinking and analysis has fallen out of favour with our culture. Music, playing, art, drawing, painting, poetry have been reduced in the curricula of our schools in favour of others that support logical analysis.

The Science 2 worldview is a direct result of the cultural domination of our left-brain activity. This is not necessarily the result of science as such. Any good scientific activity needs a lot of right brain activity. There are whole movements that try to save the experiential, holistic, right-brain mode of operation. The human potential and humanistic psychology movement of the 60s and 70s was one. In the 80s and 90s, the transpersonal psychology movement grew out of this original movement. Both tried to counterbalance an over-simplistic and scientifically narrow view of the human being.

We can also see the counter-movements in the fundamentalist religious groups that ignore hard scientific evidence. They favour a very vague inner conviction that they have a true access to reality. This is very often paired with a highly experiential mode of religious expression such as dancing, singing, shaking and other hypnotic group rituals. This counter-balancing also is expressed in escapist behaviours within our left-brain dominant culture such as rave parties with drugs and mind-numbing music and dancing. This does not mean that we think these movements are on the right track. They are merely a symptom of the overemphasis on left-brain modes of operation in our culture.

These counter moves are also present in complementary and alternative medicine. The analytical and mechanistic mode of conventional biomedicine is countered by treatment modalities that are more "holistic", "intuitive" and "energetic". These approaches do not intervene but instead stimulate self-healing. While these therapeutic options are often accused of being little more than placebo, they work quite well in practice. This is likely because they stimulate the right brain hemisphere's holistic, experiential and meaning making function. Indeed, some imaging studies show that the strongest predictor for placebo analgesia is strong activity in the right hemisphere associated with the dopamine reward system.

Following McGilchrist's argument, the Science 2 worldview is an expression of this over-dominance of left hemisphere activity and its associated logical-sequential, algorithmic processing. While we need this activity, an exclusive focus solely on this aspect involves ignoring other obvious experiential content and information.

In some cases, this can lead to mental illness. For example, schizophrenia is characterised by a left-hemispheric over-activity. This is experienced through the continual hearing of language processes which can be referred to as "voices". Schizophrenia is a relatively recent mental illness. It emerged around the time of industrialisation just as the left hemisphere approach was gaining cultural dominance. Further research also highlights that an imbalance between the activities of the two hemispheres can lead to depressed mood and lowered affect. The crisis in meaning that we mentioned in Chapter One seems to have some relationship with this left-brain dominance.

A way to illustrate left-brain dominance further is to think of the well-known military strategy "divide and conquer". If you face a powerful enemy, try to get him to separate his forces into smaller bits. Then deal with each of them separately. The standard operating procedure of the Roman army was "divide and conquer". This is similar to the analytical approach of reducing a complex concept into smaller bits which was used successfully by the classical philosopher, Plato. As an analytical strategy it is a helpful tool. It takes a complex problem and breaks it down into key elements that can then be better understood. It may even be that military strategy and the analytical approach of taking concepts apart belong to the same left hemisphere mode of functioning.

In real life, left brain activity is heavily supported by right brain activity and vice versa. The left-brain analytical mode needs the support of the right brain holistic mode otherwise it would end up with a lot of single pieces that it couldn't make sense of. Conversely, the holistic mode needs the analytical mode to understand the working principles of complex systems. This is demonstrated by the counter strategy Hannibal adopted against the Romans. If your enemy is too strong, collect a number of weaker forces together to win. When Hannibal crossed the Alps, he used this strategy to gather a huge army from Celtic tribes that ended up being the greatest threat to Roman rule ever seen.

The success of science has been to use binary logic to take systems apart by identifying basic elements. Part of this is also the analytical categorisation process in naming the different parts. For example, in asking about the nature and essence of life we have taken cells apart to identify the regulating principles. We now understand bio-molecules such as DNA, transmitters and their receptors, principles of genetic coding, etc. To use the military analogy, we have divided and conquered. Our current challenge is to understand how all these parts work together. The principles that govern how the parts behave together can only be understood through the behaviour of the larger elements they make up. Understanding how Hannibal became the greatest threat to Roman rule ever seen is only possible by looking at the unified behaviour of all the Celtic tribes he brought together.

Gene regulation is not a simple 1:1 transcription process. To understand the behaviour of a gene, we need to consider all the genetic material of the organism as well. We also need to look at other factors that may impact the gene including the environment. How the environment impacts a gene is the result of the behaviour of an organism. In humans this means considering our lifestyle decisions. What we eat, how we sleep, what we drink, the strength of our relationships, where we live and our activities are all factors that will impact the regulation of one gene. It is only once we take the whole behaviour of a living system into account that the single gene's behaviour makes sense. Part of the whole behaviour also means understanding how the genes change from parent to offspring.

The Science 2 worldview values the binary logic and analytical strategy of the left-brain hemisphere more than it does the right brain. It now needs to readdress this and focus more on the complementary strategy of right brain holistic synthesis. We believe that doing so will help us address some of the crises science is currently facing.

Starting at the individual level, the methods of bringing balance to our left and right brain ways of thinking are activities that emphasise the right brain approach. These are art and music, poetry, painting, rhythm and meditation. When a meta-analysis of all studies that used magnetic resonance imaging (MRI) of the brain in meditation was carried out it provided some interesting results. The brains of experienced meditators showed an increase in white-matter thickness, i.e. better connectivity in the corpus callosum. This is the strong fibre bundle that connects the left and right hemispheres. It is important for exchanging information between the hemispheres and hints at better balance.

However, to do this on an individual level is not enough. We need to also do this on a social and educational level and create a culture of consciousness.



Jean Gebser (1905-1973)

## “A STUDY OF INTEGRATED CONSCIOUSNESS IS ANTI-SCIENTIFIC”

There are a number of ideas about an integrated understanding of consciousness. They are often misunderstood and ridiculed. The key argument of this report is a more expanded view of consciousness will help develop Science 1 methodology and develop a Science 2 worldview into an expanded Science 3. In the following chapter, we will explore the evidence that supports this.

One of the key ideas of an integrated understanding of consciousness comes from the 20<sup>th</sup> century German philosopher, linguist and poet, Jean Gebser. He argued that there are five stages of the cultural development of consciousness. They exist across the ages through time and also within each individual's developmental trajectory. While we present the stages as linear in this description, how they appear are more nuanced than this.

The first stage is called “archaic” consciousness. We have very little evidence and knowledge of this. Gerber assumes that this is the consciousness of complete unity with nature. Early hominids or animals may experience this type of consciousness. Another example may be the early experience of a foetus or very young baby.

The second stage is called “magical” consciousness. This is where a separation of consciousness from nature is observed for the first time. Consciousness here has a double aspect to it: It is only possible to experience if there is still a sense of universal connectedness. Magical rituals that are meant to dominate nature are an example of this consciousness. Gebser thinks this is the place of group ego and not the individual I. He supposes that this is the working mode of consciousness of ancient people and of tribes today that still follow some kind of Neolithic lifestyle.

The third stage is called “mythical” consciousness. Gebser argues that this is an emotional consciousness more focused on the individual experience than the group. It is a fight against the forces of Nature and the inner emotional demons. He cites examples of this consciousness in the heroes of Homer's poems; Achilles and Odysseus. Here the heroes are described in their own individual typicality but are driven by affect and emotion. Achilles is driven by his wrath and later his anger about the death of his friend Patroklos. Odysseus has to fight against the Gods and the powers of nature in order to remain whole and return home.

The fourth stage is called “mental” consciousness. Gebser considers this to have started with the classical Greek period. This mental consciousness differentiates between human consciousness and everything else, especially the world and its surroundings. It focuses on self-reflective thoughts about the human being and its role in the world. This includes ideas about the coming and going of things, the goal of a human life and its role in the cosmic story. What the role and power of Gods, including whether there might not be any in the first place are also part of this way of thinking. Scientific reasoning is considered the prime expression of this mental stage of consciousness. To make his point, Gerber uses a large number of cultural, artistic and philosophical ideas as evidence. The strongest imaginary symbol for this stage is the invention of the perspective in painting: it embodies the distance of the observing person from the world, the highlight of the mental phase in the development of consciousness.

Gebser notes that as an individual or a culture goes through the transitional period between stages there is also signs of regress. Older layers of consciousness are re-enacted. He diagnoses our time as a transitional time where a new form of consciousness is emerging.

This emerging fifth stage is called “integral” consciousness. Gebser assumes that this stage will integrate earlier types of consciousness together in a way that we can consciously use to understand ourselves and the world better. He calls this structure of consciousness a-perspectival and a-categorical. There are all sorts of perspectives in one. It also transcends categories and categorising. Quantum theory is cited as evidence for emerging consciousness as is cubist painting where different perspectives are present in one. In an integrated consciousness, more ancient ways of thinking about the world are available but in a more conscious mode.

## “ETHICS AND MORALS ARE NOT A SCIENTIFIC TOPIC”

Morality, ethics and values used to be guaranteed by the majority of people following religious teachings. When we use these terms, we mean ethics as the wider concept. Morality is how the code of ethics is defined. It is values that underpin morality.

The beginning of the scientific age saw ethics as being created by society. Thomas Hobbes, one of the founders of modern political philosophy, argued that the power of sovereigns came from the necessity to channel potential fights between people into peace. Explicit political negotiation was needed to guarantee morals and sustainable values. One of the most influential modern Western philosophers was Immanuel Kant. He argued for a transcendent moral principle to guarantee morality yet recognised that it could not be empirically or rationally derived. Kant thought that the biblical golden rule “Do unto others as you would have them do unto you” was enough to create morality.

The problem with this rule arises when people have different moral values. Just because a person may steal someone’s car because they believe no one should own cars does not make it morally justifiable. The same goes for someone who believes that it is okay to sleep with whomever they wish regardless of the other person’s existing relationships.

Ethics, morals and values need to be made clear and built on a solid foundation. In the past it was easy to do this in social groups through punishing those who went against them. In today’s global world this is no longer possible. When we look at a number of conflicts faced by the United Nations, we see different moral assumptions at play. Western countries often prioritise individuals and their rights. Other countries such as China start from a place of assuming that the collective needs are a priority. We can see this at play in how different countries have handled their response to the Covid-19 pandemic and by how people have responded to this.

Political negotiation and consensus-seeking may work for a lot of problems. However, this approach makes ethics and morals like commodities to be bargained and traded with. There is also the challenge of political groups starting to deny certain values or ethical principles. What happens if in the future the right of old people to live and die in dignity is challenged by certain political groups? Under the pressure of economic necessity, an argument could be created here that people can only live if they have the financial resources to sustain themselves. Otherwise they are euthanised to save government resources. What happened in Nazi-Germany shows that it is possible to install such a programme at a national level without much resistance. Is it too far-fetched to assume that broad consensus could end up installing something similar world-wide?

Consensus is no basis for ethics and morality. It cannot guarantee values. Science, as it currently stands, has nothing to say in that area either. The discussion of ethics and morals in Science 2 worldview programmes generally uses the biblical golden rule. It also relies on the assumption that when everyone agrees on a Science 2 worldview ethics and morals will be understood. What if someone does not agree?

Values and morality do not occur in the natural world. They cannot be studied scientifically with Science 1 methodology. Science can only study how people create values, what this does for them and how they change. This does not define which values and norms are “right”. Science considers itself as inquiry into knowledge. Yet it is neglecting the most important question; how do we arrive at worthwhile knowledge?

## QUESTIONS FOR REFLECTION:

- Which of the key background assumptions can you see at work within your own thinking?
- What is the interplay between the left and right hemispheres of the brain in your daily thinking and behaviour?
- What knowledge do you think is valuable and worthwhile?

# CHAPTER FOUR

## LIMITATIONS WITHIN MODERN SCIENCE

*“What passes for science nowadays is not scientific enough; and that as a result we are missing great potential discoveries and stultifying the human mind.”*

~ Dr Iain McGilchrist

When we look back at history, the pioneers of the scientific revolution didn't possess a Science 2 worldview. It is something that has emerged over time. Ancient Greek and Roman philosophers argued for the existence of God. We see the continuation of a link between science and spirituality even in the times of Galileo. The first self-proclaimed atheists emerged during the enlightenment at the same time as belief in science was increasing. And for some, science became the new religion.

In 1916 the American psychologist James H Leuba empirically studied the belief that scientific progress would extinguish religion among scientists and the population at large. Leuba asked scientists about their belief in God and immortality. Roughly 42% of scientists believed in a personal God. Another 41% were disbelievers and 17% had doubts. In 1996 the American historian Edward J. Larson and the American journalist Larry Witham tried to replicate this study. They sent questionnaires to 1,000 randomly sampled scientists from the register 'American Men and Women of Science'. The responses were smaller, yet similar 80 years later. This time, 39% of scientists believed in a personal God. The number of disbelievers increased to 45%, with 14% having doubts. Leuba made a distinction between scientists and "greater" scientists so Larson and Witham did another survey with members of the US National Academy of Science (NAS). They found that more than 90% of these "higher echelon" scientists were either atheists (72%) or agnostics (21%). More than 92% did not believe in immortality.

What this shows is that the belief system of more prominent scientists seems to be more associated with "science" than is warranted. These scientists will be more vocal and present in the public arena. They have more power in defining research topics, distributing funding and deciding on the publication of papers. This means is that a Science 2 worldview is assumed to be correct simply because the majority of powerful and well-respected scientists hold these assumptions.

As we pointed out earlier, these assumptions are neither true nor false. They are a way of looking at the world that emerged alongside science. This is why understanding the research on consciousness is so important. A Science 2 worldview only works if we can explain conscious experience through that worldview. For a Science 2 worldview to be valid, consciousness has to be created by the brain. Yet a Science 2 worldview of consciousness is still far from being realised despite suggestions to the contrary.

The main argument against it is a philosophical categorical difference between mental and material attributes. It is not a popular argument because some people assume that this argument actually supports a Science 2 worldview. A category mistake can be illustrated by the wrong use of language. "The lemon is tuned in A minor." "The clouds speak in a low voice." The only place these things happen is in poems or the language of schizophrenics. When we overlook these category differences, we create category errors. We act as if lemons can be tuned in A minor and clouds can speak in low voices. There are a number of categorical difference arguments in the scientific literature. These arguments are ignored, brushed aside and not fully addressed.

## EXISTING SCIENCE 2 WORLDVIEW UNDERSTANDING OF CONSCIOUSNESS

There are many different Science 2 worldview models of consciousness. Their basic structure starts with the fact that the brain is a complex system. After the brain reaches a certain level of complexity, consciousness is produced. This is because of the way the brain works. Consciousness is therefore different from the brain but dependent on it. When the brain is switched off, as in anaesthesia, consciousness goes. If some brain activity is reduced like when we sleep, we are unconscious. If the brain dies then our consciousness, sense of self and experiences die as well because they are dependent on brain activity.

Not only is consciousness created by the brain but it can also impact the structure of the brain through conscious activity. London taxi drivers learn complex road maps and the brain matter in their right hippocampus is increased. Grey matter increase depends on learning a new skill such as juggling and it decreases if practising is reduced. Meditation can change the structure of the brain. These data rule out any models that suggest that consciousness is solely a result of physical and biochemical events in the brain.

However, we do not need brain imaging data to prove this. We experience this every time a conscious impulse leads to action. I want light and get up to switch on the light. I want food and go to the fridge to get something to eat. It also works the other way around when we stop ourselves from following an impulse. I want food but decide I have eaten enough and so do not eat any more. I decide to fast for a week and overcome the initial impulses to eat until I reach a ketogenic state where hunger subsides. These examples show how conscious action can impact the world around us.

The standard argument against this comes from a misinterpretation of the research by the American consciousness scientist, Benjamin Libet. He famously conducted an experiment that has been replicated several times. Participants had to decide when they wanted to move a finger. They watched a clock like device and told the researcher when the wish to lift a finger happened by indicating it on the device. At the same time their brain activity was measured. It turned out that even before the participants lifted their finger, the readiness potential in the brain was already preparing for action. This happened before the participants were conscious of the wish and decision to lift their finger. These studies made it seem like the conscious action and inaction was actually a lie. Yet the participants of these studies could also decide not to take action when they felt the wish to do so, a fact that is often neglected.

Readiness potential is interpreted as whenever someone is preparing for a voluntary movement the brain drifts into negativity in the motor area. Yet the electrical polarity of brain activity is constantly changing in slow waves from positivity to negativity. It so happens that voluntary movement is more likely when the brain is in negativity but it can also happen when the brain is in positivity. When Libet's experiments were carefully re-examined about 30% of movements also happened during positivity. Replicated studies with skilled meditators demonstrated that negativity in the brain can be felt as an internal impulse which they are easily able to withhold. This shows that Libet's original studies simply demonstrate that actions are more likely during certain conditioning that the brain provides. However, the brain neither forces the action nor prevents it from becoming active. Therefore, brain activity cannot explain how our conscious actions impact the world.

There are two arguments against consciousness emerging from the brain. One is philosophical and theoretical. The other is empirical. It is here that we are going to focus our attention. The philosophical and theoretical argument can be explored further on page 48 of the Galileo Report.

## DATA THAT CHALLENGE MATERIALISM

There are three different strands of research which challenge the Science 2 worldview:

1. First person experiences of deep mystical states and spiritual experiences use language that doesn't fit with an understanding of a materialist view of the world.
2. Research on anomalous cognition such as telepathy, clairvoyance, psychokinesis and precognition need to be evaluated against materialist assumptions.
3. Some Near-Death Experiences (NDEs) and experiences of children who remember past lives contradict the view that consciousness is dependent on the brain.

## NEAR DEATH EXPERIENCES

NDEs became a focus of serious research in the 1980's after reports of people having vivid experiences during times when brain functioning was missing. These build upon earlier reports in German research from the 1960's. The 20<sup>th</sup> century German philosopher, Wilhelm Wundt also reported a similar experience. He is considered one of the founding fathers of modern psychology. It had such an impact on Wundt that it changed his life and attitude towards psychology. Wundt became seriously ill for a long time. His doctors considered him a dying man. Writing about it, Wundt stated:

*“It was not the whole time of my sickbed, but the first hours or days that produced a complete reversal of my views on life, I daresay. The doctors had given up on me...I myself had sent for my...brother to say farewell. Never again in my life, however, did I experience the impression of such a perfect calmness as in those hours...If there is just one help that is rarely granted to a human being and precluded to most, it is this: this help consists in completely forgetting the physical fetters despite their power and to cut through to that peace of mind by self-discipline, which is granted to a painless dying person all by itself.”*

Wilhelm Wundt's experience is not a classical NDE which normally occurs during unconsciousness. However, it is an experience of a seemingly dying man who was certain that his life was ended. It was also transformative.

The transformational power of NDEs is well documented and should be an extremely interesting element for research. Why and how would such an experience transform people's opinions and world views? What are the important elements that achieve such a transformation? For Wundt, it was the experience of unity with the world and the universe. It matched the descriptions of the famous medieval mystic and Dominican friar and Paris master Meister Eckhart. NDEs often have similar qualities as mystical and spiritual experiences.

While Wundt's experience does not challenge the Science 2 worldview, there are types of well-documented experiences that do. These are experiences where consciousness has occurred during times where objective evidence shows that blood circulation is absent for at least 10 minutes. In most cases it is longer and brain death is medically documented. Rich conscious experiences occur. Sometimes they are accounts of people watching what is happening to their body. These accounts are verified as true by others. Other accounts are of distant events that are also verified as true by others. Sometimes people have an NDE that leaves them with extraordinary capabilities such as clairvoyance or healing.

There are over 100 robust documented cases like these published in scientific literature. These cases only include date when there was medical or other evidence about the state of the person. This is absence of heartbeat and blood circulation along with brain death measured by EEG. Even though there may be

some detectable activity of neurons and brain cells after a flatline EEG result, this is not relevant here. For consciousness to emerge from the brain, coherent measurable brain activity of higher centres or the cortex would be needed.

In all 100 documented cases there was no higher brain activity to speak of. Yet each person reported afterwards experiences of heightened consciousness. Some saw and heard events that were happening around them. Others knew things about events that had happened far away. Even if they had been conscious, it would have been impossible to access this information. Some cases report concrete things, like a shoe on the top of the hospital building or a coin on top of a medical apparatus. They were later verified and as the person had never been to that hospital before could not have known this. Another example was of a conversation that was held miles away and was later confirmed as accurate.

Pim van Lommel is a Dutch author and researcher in the field of NDEs. He worked as a cardiologist for 26 years and conducted the first systematic prospective study in all Dutch hospitals on hundreds of NDEs following heart attacks. He talks about one particular patient who had been unconscious for about 15 minutes after his heart attack. He was rushed into emergency. To intubate him, the nurse took out his dentures and placed them on a rack. When the patient was better and about to be discharged from intensive care, he recognised this nurse. This was the first time the patient had seen the nurse while conscious. The patient told the nurse that he was the one who had taken out his dentures and placed them on the rack. The patient had seen the whole procedure from above. This is one example of a highly precise and verified "perception" during unconsciousness and missing higher brain activity. The patient had literally "seen" events around him even with his eyes closed and consciousness gone. He had no blood circulation and it was likely he was brain dead. He had no active higher brain functions to see, know what he was seeing and to remember it.

## NONLOCALITY

In 1944, one of the most influential and well-known 20<sup>th</sup> century psychologists Carl Jung had a heart attack and experienced his own NDE. Part of his experience was seeing the earth from a great height. Science hadn't yet taken humans into space to see the earth as a whole. Yet Jung's description is consistent with images we now have of the earth from outer space.

*"It seems to me that I was high up in space. Far below I saw the globe of the earth, bather in a gloriously blue light. I saw the deep blue sea and the continents. Far below my feet lay Ceylon, and in the distance ahead of me the subcontinent of India. My field of vision did not include the whole earth, but its global shape was plainly distinguishable and its outlines shown with a silvery gleam through that wonderful blue light. In many places the globe seemed coloured, or spotted dark green like oxidized silver. Far away to the left lay a broad expanse – the reddish-yellow desert of Arabia; it was as though the silver of the earth had there assumed a reddish-gold hue. Then came the Red Sea, and far, far back – as if in the upper left of a map – I could just make out a bit of the Mediterranean. My gaze was directed chiefly towards that. Everything else appeared indistinct. I could also see the snow-covered Himalayas, but in that direction, it was foggy or cloudy. I did not look to the right at all. I knew I was on the point of departing from the earth."*

This is an example of a complex visionary experience during a near-death experience. Other examples from van Lommel's and others research, illustrate what is called "non-local perception". In these experiences, information is perceived for which no signal-theoretical trajectory is possible. The idea of locality comes from Special Relativity. This part of Einstein's relativity theory states that no signals in the universe can surpass the speed of light. The moon is about 300,000 km in distance from the earth. The speed of light is 300,000 km per second. Therefore, it takes one second for a signal to go from the earth to the moon.

Suppose we were to install an alien-detering system on the moon because we are afraid aliens would blow up the moon. This system is meant to discover and destroy alien ships as soon as they approach the moon. However, it is operated from Earth. When an alien spaceship is discovered, this system sends a signal to Earth. A computer on Earth creates a quick target analysis and gives the "fire" command. This is impossible. The signal from the moon to earth would take a second and so would the "fire" signal from earth. In those two seconds the aliens would have destroyed the moon because the signalling system was too slow.

Any form of perception that uses electromagnetic force with photons as exchange particles cannot perceive events that happen at the same moment at a larger distance because they are too far away, or that happen in the future. Non-local perception challenges this.

## EXTENDING PHYSICS FOR PSI AND MIND

Experiences such as NDEs belong to a category of phenomena known as psi. As they involve an interaction between consciousness and the physical world, this would require an extension of physics. Critics of psi claim that an interaction between consciousness and the physical world cannot be real because standard physics seems to work so well. Both relativity theory and quantum theory have been confirmed with extraordinary precision. They argue that none of the known physical interactions could explain psi. They query that if consciousness really can affect the physical world directly then why does it not show up in ordinary physics experiments, where the effects involved are often tiny? An example of this is the detection of gravitational waves by the LIGO experiment. LIGO stands for the "Laser Interferometer Gravitational-wave Observatory" which is operated by Caltech and MIT. This experiment involves displacements of a thousandth the size of a proton. The energy involved to displace the LIGO mirrors in contrast is quite large.

This argument may well make it impossible to explain psi through the sort of field or particle familiar to current physics. However, physics regularly undergoes paradigm shifts. A new type of field which transcends the usual spacetime description is possible. Mainstream physics already accepts that both relativity theory and quantum theory must be modified to fit any final theory of quantum gravity. The current paradigm in physics is incomplete so the precision test of the LIGO experiment is irrelevant in this context.

Whatever the form of the new paradigm, we would expect it to involve mentality in some way. A theory is needed which accommodates all mental phenomena and not just the ones labelled psi. There is already a big problem extending physics to accommodate aspects of ordinary mind such as sensory perception, memory and dreams. What is needed is a theory of consciousness itself. There is some indication from physics that this may be a fundamental rather than incidental feature of the world. One of the founding fathers of quantum theory, Austrian Wolfgang Pauli, stated that no physical theory would be complete if it were not able to include consciousness.

The most popular approach right now involves quantum theory. This already exhibits a host of weird effects, e.g. non-locality and entanglement. It is also the one context in physics where the observer may play a role. It was even claimed in the 1950's that consciousness is involved in the collapse of the quantum wave function, though this is a minority view. Despite the impression given in a number of popular books, standard quantum theory cannot explain psi or even normal mental phenomena. To do this, it needs some non-standard extension of quantum theory.

Yet extensions of quantum theory cannot describe the full range of psi phenomena. Extensions may play a role but they cannot offer a complete picture. What is needed is a deeper paradigm of physics that supports both mind and quantum physics to advance. This paradigm must transcend the usual description of time and space. It also must involve mentality at some fundamental level.

A way to do this is through hyperspatial models. These models interpret paranormal mental phenomena as influences from higher dimensions and have a long history. In the late 19<sup>th</sup> century, the possibility of an extra spatial dimension was popular. The arrival of relativity theory made it clear that there really is a 4<sup>th</sup> dimension of time. This led to some people attributing esoteric significance to dimensions while others explored how to add more dimensions to models.

Philosophers have created a different approach to extending hyperspatial models that involves the mind directly. This approach involves the relationship between physical space and perceptual space. The British cosmologist Bernard Carr advocates a hyperspatial model known as the Universal Structure. Many psychic experiences seem to require the existence of some form of communal space. This is not the same as physical space. This is hypothesized to be a higher-dimension space where physical space and ordinary perceptual space are just lower-dimensional projections. This Universal Space can be viewed as an extended reality. It is an information space that goes beyond physical space but subtly interacts with it. There is also a hierarchy of times, with mental time being separate from physical time. The empirical reports of NDEs may provide support of this.

Not all physicists like higher-dimensional theories. They are currently untestable and could be regarded as mathematics instead of physics. However higher-dimensional theories such as M-theory are worked on by eminent physicists. This provides a place where the Science 2 worldview could become expanded Science 3 to include physical, psychical and even some mystical phenomena on a natural continuum. Despite being very speculative, the hyperspatial approach shows that an extension of physics which accommodates mind is at least possible in principle and may well prove necessary.

## NDES, NONLOCALITY AND CONSCIOUSNESS

This brings us back to the non-local nature of some NDEs. It is very difficult to explain validated accounts of events that happened surrounding an unconscious body or happened even far away through a standard consciousness model that depends on fully functioning brain activity. We do not have any evidence of this even though some form of perception is occurring.

If we were prepared to see consciousness as an entity separate from the brain, it would not even require non-locality. We could then argue that while the body is not fully dead, there are some conscious aspects of the human being that could have their own perception. Normally this perception is fully synchronized with brain activity so we do not perceive any difference. In moments of extraordinary threat or danger it might become dislodged, yet still operative. This would make sense of experiences such as "seeing from above", "hovering at the ceiling" or "standing next to the body".

There are also NDEs that have a non-local connection of consciousness to a material reality. One of the most striking examples is another one reported by van Lommel. A man saw himself in his NDE approaching dead relatives whom he knew. There was also a man that he did not know who looked at him lovingly. On his mother's deathbed 10 years later, she confided in him that he was not the son of the man she had married. He was the result of an affair with a Jew who was deported and killed by the Nazis. When she showed him the picture of his real father it turned out to be the man who had previously appeared in his NDE.

If this story is true, it shows that a NDE has a cognitive component of seeing and remembering a stranger's face. It also has a clairvoyant component as the person was unknown at the time but turned out to be the dead father. One might try to explain this away with a rational thought process. If it were just one isolated story that would be easy. However, as we mentioned previously, there are over 100 similar cases documented in scientific literature to stringent criteria. There are many more stories like these that didn't make the criteria. In van Lommel's research alone, there were 334 experiences that he documented during his time as a cardiologist.

There have been serious attempts to understand NDEs from a Science 2 worldview. These approaches assume that NDEs are happening as the brain starts working again. The argument states that when the neural system starts functioning there will be some unconnected brain activity which may be experienced as imaginary events. The tunnel experience that many people have during a NDE is merely caused by particular brain patterns at the time. These potential explanations fit some experiences but not all. But it does not explain why, if these are waking-up experiences, NDEs are comparatively rare. The majority of people resuscitated do not have NDEs.

The collection of 100 documented cases in scientific literature was aimed at excluding these explanations. The selection criteria ensured that the explanation of the unconnected brain activity was not valid for any case. We have already mentioned that residual brain activity does not count as we require a fully functioning cortex to sense, recognise, categorise and remember. These 100 cases pose a challenge to any Science 2 worldview

that claims consciousness is an emergent property of brain function. Past life memories and the database of parapsychology or anomalous cognition adds to this challenge.

## PAST LIFE MEMORIES

There are over 2,500 cases of children between the ages of 2 to 4 who claim to remember previous lives. This database was created through research started by Canadian-American psychiatrist Ian Stevenson and continued by Icelandic psychologist Erlendur Haraldsson and others such as Jim Tucker from the University of Virginia. In some of these cases it was possible for the researchers to collect independent evidence to support the children's stories. Sometimes birthmarks were present in places that represented previous health issues or cause of death according in some cases to official medical records.

While a lot of these cases are unsolved, a number can be traced back and confirmed by independent evidence. These cases raise fundamental questions about the nature of consciousness. How can a young child remember memories of a previous life if consciousness is nothing more than an emergent property of the brain?

## THE ANOMALOUS COGNITION DATABASE

We use parapsychology and anomalous cognition interchangeably to talk about four different types of phenomena. Anomalous cognition emphasises the fact that the types of cognition we are going to talk about are an anomaly or 'impossible fact' in the Science 2 worldview. The term parapsychology suggests an otherwise accepted fringe area of science. These anomalies are not accepted. They are not fringe because the questions raised are central to the pursuit of science, as we have already shown.

## TELEPATHY

Telepathy is remote contact with a person who is not present. The term was invented by classical scholar Frederic Myers and means to feel at a distance. It is also an understanding of a person's mental content without further means of communication. A classic example of this concerns the founding story of the electroencephalogram (EEG). When its inventor German psychiatrist Hans Berger was 19, he was part of a military exercise in Würzburg, Bavaria. He tripped, fell and was nearly run over by horses towing a gun. The very next day he received a cable from his father asking if he was alright. He received this telegram because of a close bond with his sister who was 100 miles to the East. She insisted something was wrong with Berger and arranged for her father to cable him. Berger thought some electric radiation must have gone out from him. To test his theory, Berger developed the EEG. He thought that there might be brain-currents that could explain what had happened. However, Berger quickly realised that the current was much too small to be able to transport information over a long distance.

Experimental research into telepathy often used dream telepathy or Ganzfeld studies. Dream telepathy means that a "receiver" is asleep while a "sender" in a remote and often specially shielded room views images that are supposed to be "transmitted" to the receiver. The receiver is questioned upon waking and then the information is presented to neutral judges who have to rate the match between the dream and the images. The same set-up is used in Ganzfeld studies except that the target person is awake and shielded from sensory expressions through goggles and headphones in a state that is called "Ganzfeld".

A meta-analysis of all dream telepathy studies from 1966 to 2016 found 50 studies. A large set came from the 'Maimonides Dream Lab' with 14 studies while the other 36 were from other labs. The Maimonides studies had stronger results yet all studies were shown to be highly significant when analysed. In a meta-analysis of all Ganzfeld studies a significant effect was also demonstrated. In statistical analysis, a significant result in statistical analysis means that there is less than 5% chance that the results are due to chance.



William James (1842-1910)

## CLAIRVOYANCE

Clairvoyance is the ability to target anything that cannot be known such as events in a person's past. A special branch of clairvoyance is *remote viewing*. This is where someone is tasked with seeing and describing things or events that happen at distant locations. This type of clairvoyance has gained some notoriety. Both Russian and US intelligence used clairvoyants for espionage. Recently released and declassified reports of the US studies contain a meta-analysis and review of all remote viewing studies done by the CIA and military. In total, 117 documents showcase 25,449 experiments with statistically significant effect. Electromagnetic shielding does not impede the effect, making classical local interaction via electromagnetism unlikely. Distance and size of the target seem to be irrelevant. The review concludes that about 1% of the population possess this ability and that it does not seem to be teachable.

The former President of the American Statistical Association, Jessica Utts conducted the analysis. Her presidential address to the association stated:

*“Parapsychology is concerned with the scientific investigation of potential skills that are commonly known as psychic abilities, such as precognition, telepathy, and so on. For many years I have worked with researchers doing very careful work in this area, including a year I spent working on a classified project for the United States government, to see if we could use these abilities for intelligence gathering during the Cold War. This 20-year project is described in the recent book ESP Wars East and West by physicist Edwin May, the lead scientist on the project, with input from his Soviet counterparts. At the end of that project I wrote a report for Congress, stating what I still think is true. The data I support of precognition and possibly other related phenomena are quite strong statically, and would be widely accepted if they pertained to something more mundane. Yet, most scientists reject the possible reality of these abilities without ever looking at data! And on the other extreme, there are true believers who base their belief solely on anecdotes and personal experience. I have asked the debunkers if there is any amount of data that could convince them, and they generally have responded by saying, “probably not.” I ask them what original research they have read, and they mostly admit they haven't read any! Now there is the definition of pseudo-science – basing conclusions on belief, rather than data! When I have given talks on this topic to audiences of statisticians, I show lots of data. Then I ask the audience which would be more convincing to you – lots more data, or one strong personal experience? Almost*

*without fail, the response is one strong personal experience! Of course, I'm giving you an extreme example, and I think people are justifiably sceptical, because most people think that these abilities contradict what we know about science. They don't, but that's the subject for a different talk!"*

## PRECOGNITION

Precognition is perception of future events. These often come in dreams or vivid imagery. Scientifically speaking, it is the most challenging phenomenon. If we suppose that a causal signal of some kind transmits this information, then we have to assume that it contravenes the locality assumption of Special Relativity, which we mentioned during the thought experiment with the alien ship and the moon.

Often precognition is experienced as a premonition. A classic example comes from the New York archives of the American Parapsychological Association. A mother reported that one night she felt compelled to take her baby to her own bed. Usually the baby slept in its own crib. The next morning, she saw that the heavy crystal lamp that hung over the baby's bed had fallen down into the crib. Had the baby been in her crib, she would have been severely injured or killed.

Precognitive experiences seem to have some biological significance. Whoever is able to anticipate danger or prey has a clear advantage of survival. There are examples of pre-sentience based on classical electromagnetic signals. For example, about 20% of patients with chronic headaches or migraine react sensitively to ultra-short electromagnetic pulses that are normally produced by weather fronts. Known as sferics, they travel ahead of a front at the speed of light. This would help someone find shelter before the arrival of bad weather and makes sense in terms of evolutionary benefits.

Animals also seem to act precognitively. The British researcher Rupert Sheldrake studied how a dog seemed to know when its owner was coming home. Decoys were used to exclude classical perception. The dog could be reliably observed sitting expectantly at the front door some time before the arrival of the owner. The sceptic Richard Wiseman replicated this exercise and found it unsuccessful. However, when the data was reanalysed, it was found successful.

The well-known American social psychologist Daryl Bem used retroactive priming to conduct experiments on precognition. Priming is known in psychology to accelerate processing of certain types of semantic content or to improve memory retrieval. For example, if someone was to memorize words like "beauty", "health", "sexy" and then shown an image of a young and old person, the words associated with the younger person would be easier to recall.

Normally the priming stimulus is shown before the target. In Bem's studies, the priming stimulus was shown after the image. This was designed to explore whether the words the participants used for the images before seeing the priming content would match it afterwards. If so, it could suggest that somehow the participants knew what words would be shown to them afterwards. A series of experiments showed the retroactive priming produced a clear statistically significant effect. Bem's popularity triggered a number of replication studies. A recent meta-analysis including all 90 experiments from 33 laboratories still shows a clear significant effect. The negative results were also included. This produces a Bayes factor over 100 which is considered the threshold for decisive evidence. When these results were published, they were heavily attacked by materialist scientists.

Presentiment research uses unconscious physiological measures. Our sweat glands react very quickly to autonomic arousal such as fear. Presentiment research studies show fear related unconscious physiological reactions *before* a fearful stimulus, usually an image, is presented. Fearful and calming visual images are mixed together and then the period before each image is compared. A meta-analysis of 27 studies confirms that this is unlikely to be due to chance.

It is easy to find fault with a single study or meta-analyses. It is far harder to explain the full database.

## PSYCHOKINESIS (PK)

PK is the ability to interact directly with other physiological or physical systems. Normally our intention needs physical signals to become effective in the world. If I want light, then I get up to switch on the light. I do not think "let there be light" and then the light comes on. PK effects are intentional effects of human thought without apparent physical action. I think "let there be light" and the light comes on. These are both challenging to think about and difficult to reconcile because they involve both information transfer and action.

There are three separate meta-analyses of research on PK effects. One analysis looked at the effect of human intention on random event generators. A large number of these were conducted by the former Princeton Engineering Anomalies Research (PEAR) amongst others. In total, 380 single trials were analysed to reveal a small but significant effect. The last three of these studies involved a replication study from three laboratories from Princeton, Giessen and Freiburg. Together they are the largest database and were meant to be a single and definitive replication of the Princeton protocol. However, the study was negative and led to the meta-analysis being only significant. The meta-analysis would have been highly significant if the last three studies had been excluded from it. This pattern is frequent and reveals problems with PSI research. Previous results are not replicated. This may be due to the fact that PSI does not operate via classical signals, such as electromagnetic radiation, and hence direct replications are not easy. But the bulk of the evidence, which is given by the meta-analyses mentioned throughout this chapter shows that across all studies the evidence is robust.

Critics take the lack of direct replicability as evidence that PSI effects are not real. This is a valid response given the conventional experimental paradigm of Science 1 methodology. However, if PK effects do not fit the traditional Science 2 worldview and its current understanding of Special Relativity, then this could explain the inconsistencies. This is a simplified explanation of what is a technical argument. We use it here to show why it is useful to look at the whole evidence from the meta-analyses and not just the robustness of replicability.

The PK effects on random generators is actually the weakest of the three meta-analyses in this area. The second meta-analysis analysed 49 studies where sick animals or cells were the target of healing intention and 57 studies on human physiology. In the human experimental studies, the skin's electrical current is usually measured while a remote intention is sent to calm or relax the participant. Other measures are used for animals and cells. What is measured consistently is the effect size. Both studies had small but significant changes to the effect size. Again, replication of original strong results in studies was not possible.

The third meta-analysis looked at the effects of studies on remote helping. This is where a participant has to focus on a target such as a candle and press a button whenever they lose focus. A helper in a remote location is tasked with helping the participant. The participant does not know when the helper is helping. There are 11 studies which show a significant effect when analysed together. This meta-analysis also looked at remote staring effects. This is when a participant is instructed to look at someone else through a closed-circuit TV. The skin's electrical current is also analysed here. There are 15 studies here that also show a significant effect.

Taken together the meta-analytical data on anomalous cognition provides strong effects that show significance beyond any reasonable doubt. If these were astrophysical effects they would long have been accepted. If it had been a medication it would be on the market. However, our current Science 2 worldview does not allow for such effects, so people remain sceptical. Something strange is going on. After so many decades of research the results are still hotly debated and contested. The scientific community actively ostracises the research and those who research it.

Such active or covert opposition is very likely due to the fact that the assumptions of Science 2 worldview cannot be squared with the results of parapsychological research. Yet the very essence of science itself demands that the assumptions of Science 2 worldview have to be questioned in the face of data, evidence and contradictory empirical results. The problem is that we have no fully fledged theoretical model which can accommodate both our traditional physical understanding and the anomalistic data. This is exactly why we need an expanded Science 3. If we take this research seriously, it would lead to a broader, more encompassing and perhaps even more exciting type of science.

## A GENERAL MODEL OF NONLOCALITY

Consciousness must be seen as something that is not solely dependent on brain activity. It has its own causal role not only upon the brain itself but perhaps even in some as yet little understood interaction with other physical or mental systems.

A reason why the parapsychological database is difficult for scientists to accept as fact is that it implicitly contains a non-local concept of reality. Special Relativity and its concept of locality is at the core of modern science. Together with the laws of electromagnetism this states that signals or information can only travel at finite speeds and into the future. They cannot travel back to us from the future. This makes precognition impossible.

The only way to make this work within a local model of reality is to accept an extended form of physics such as the models we have previously mentioned. While these models are possible, it would be better to begin with a less ambitious model that would start to provide a bridge between mainstream theory and the anomalous cognition database. While this might only allow for some of the data to become plausible it would initiate the conversation that needs to happen before we can reach a final model.

This is why we developed a generalised version of quantum theory. It has nothing to do with physics but is about applying the theory to different types of systems. The assumption here is that physical quantum theory is one of the most successful theories of physics. Therefore, its structure may also be relevant for other domains of reality.

There are two key ideas to understand in this generalised theory; system and incompatibility. A system is anything that can be separated from its environment to study. Incompatibility refers to ideas that seem contradictory but need to be applied at the same time. Typical examples are the wave and the particle character of light. Both descriptions are necessary to describe light, yet incompatible at the same time. Another example of this from physics itself is the clear and definitive description of a quantum system and the lack of definite description of the particles within the system until measured. This creates what is known as entanglement. Even though two objects are separate, changes in one of the objects will also cause a change in the other.

The following conditions are needed in our generalised theory:

1. There is a clearly defined system (e.g. a team/family)
2. The system contains subsystems (e.g. the individual members of the team/family)
3. The description of the subsystems is different from and incompatible with the description of the whole system (e.g. each team/family member is different)

This allows for an understanding of many of our parapsychological phenomena to be integrated into the existing scientific model as a feature of the system itself. This model has been successfully applied in a number of different studies in psychology like position effects of questionnaire items, or bistable perception of the Necker cube. It has also been used to reconstruct practices of complementary medicine and parapsychological phenomenon.

## QUESTIONS FOR REFLECTION:

- What do you think of the anomalous cognition database?
- How does it change the way you view science?
- How do you think consciousness should be studied in science?

# CHAPTER FIVE

## A ROLE FOR CONSCIOUSNESS

*“Organisms are not in the least like mechanisms, but mechanism is a perfectly useful way of looking at tiny details in a complex picture. The problem is thinking that the same thinking will help you understand the whole, which it can’t.”*

~ Dr Iain McGilchrist

The evidence base shows that consciousness has to be taken seriously. It is not simply an emergent property of the brain. It is fundamental to our understanding of science and perhaps reality. Any model of consciousness true to the data from the anomalous cognition database needs to have two minimum conditions:

1. Consciousness needs to be considered a real and active part of reality
2. Consciousness can have non-local interactions with the material world and other mental systems

While there may be a need to have a model where consciousness is more fundamental than matter, it is not a starting point. Theories of consciousness that postulate consciousness as the primary reality and matter as derived from consciousness reverse the current thinking within Science 2 worldview. They would require a major revision of accepted scientific theories or data. Historically and conceptually speaking, this is not a good solution.

A smaller step forward would be to have a dual aspect model of consciousness. This dual aspect is a complementary relationship between body/matter-mind/consciousness. There are a number of models already developed. One of these models was developed by the Dutch philosopher Baruch Spinoza in the 17<sup>th</sup> century. This model saw mental and physical attributes as two sides of one divine substance. Another was created by the 17<sup>th</sup> century German logician and philosopher Gottfried Wilhelm Leibniz. This model saw a link between the body/matter-mind/consciousness but challenged the divine substance aspect of Spinoza’s model. Many modern models either implicitly or explicitly include aspects of these.

Carl Gustav Jung, one of the most influential psychologists, and Wolfgang Pauli, one of the founding fathers of quantum physics, proposed such a model. They assumed an underlying transcendental unity called *“unus mundus – one world”*. We are able to experience this unity both materially and psychically. Both aspects are of equal importance. This unity allowed for strange experiences such as synchronicity, where material events seem connected to mental events even though they are not. The psychologist and philosopher, Harald Atmanspacher has developed this model further.

A number of other versions of dual-aspect models have been published. Essentially these revive the “one world” idea with one additional feature of complementarity. This is the fact that a quantum can be seen as a particle or a wave and that both aspects are needed simultaneously to understand a quantum. This idea came from the Danish physicist Niels Bohr who won the Nobel Prize in Physics in 1922. He explicitly names the relationship between mind and body as a potential wider application of his idea.

Dual aspect or complementarity models of consciousness are a minimum consensus. They can explain non-local effects observed in anomalous cognition through correlations between physical and mental states in and across systems. What seems necessary for this is conscious intention or need. Whether these models would be able to explain non-local perceptions without apparent brain activity such as in NDEs would have to be further studied.

What dual aspect models of consciousness do allow, though, is a way to develop new concepts. We can analyse how information is at the foundation of physical reality and therefore some mental or consciousness-like reality. This is a scientifically more responsible and fruitful approach to create an expanded Science 3 from a Science 2 worldview.

## EXPANDING SCIENTIFIC METHODOLOGY

Analytical thinking and reductionist methodology go together. They are both very useful methods. What would complement analytical methods is synthetic thinking. Synthetic thinking is when you combine a number of ideas into one and look for the patterns between the ideas. While we have been taught that it is possible to understand complex phenomena by breaking them down into smaller parts, this is not always the case.

The example we are about to share shows how a compartmentalised perspective from analytical thinking and a reductionist methodology has created unintended consequences. These potentially could have been avoided through incorporating a synthetic thinking approach.

Pharmacology has discovered lipid-lowering drugs. There is an intense debate between those who think it a good idea to lower lipids in the blood and those who think it is bad for a number of reasons. These reasons mostly refer to information *outside* the analysis of lipids and how this relates to heart disease.

Another argument states that the lipid-lowering drugs called statins block the Q10 coenzyme production of mitochondria in cells. This seems to cause the frequent statin side effects of muscle pains, although a recent study suggested that the side effects of statin are down to the 'nocebo' effect, i.e. people experience side effects because they are told they will. However, a lack of Q10 also seems to be associated with cognitive problems. Q10 supplementation can reverse some signs of dementia. Statins also change the balance in the body between the essential fatty acids Omega 3 and Omega 6. We have no studies that document the long-term effects of Q10 depletion. Yet the changing balance between Omega 3 and Omega 6 is a long-term documented problem.

Omega 3 fatty acids reduce inflammation in proteins of the immune system. Omega 6 fatty acids increase the potential for inflammation. A shift in the balance between Omega 3 and Omega 6 is already problematic in industrial countries because of our diet. More Omega 6 fatty acids are also associated with attention deficit disorder (ADHD).

A pharmacological intervention meant to lower one potential - and contested - risk factor for heart disease has a number of other additional impacts. These may be even more problematic than the effect they were meant to address in the first place. These implications are not considered, or are only considered late in the process because the analytical-reductionist methodology leads to blinkered vision. Only a single problem is focused on to the exclusion of others.

This is likely due to the huge financial stakes. As the research on anomalous cognition shows, to demonstrate a significant effect requires a lot of studies and people to take part in them. In the pharmacological industry such studies typically cost multi-millions to conduct. Serious concerns have been raised about conflicts of interest which may have caused fraud in studies and unreliable results. When you lower the clinical intervention thresholds you end up with an expanding market to sell to.

This is a familiar story in many different research areas. Many senior members of the research establishment are critical of this and call for a different form of thinking. A way forward would be to include holistic or synthetic thinking as an additional methodology to analysis and reduction. This would change the way science is done and impact how students and young researchers are tutored. It would also change what research is funded and what studies are published. Moving from a Science 2 worldview into an expanded Science 3 would place more emphasis on synthesis and holistic or systemic viewpoints.

## INCLUDING DIRECT INTROSPECTION

The current Science 2 worldview only allows one useful function for introspective knowledge or consciousness: reports of inner states as part of research. This is how standard psychology operates. Questionnaires ask about attitudes or wellbeing and assume they have introspective knowledge of them. Research in problem solving can study mental strategies by having participants speak aloud what they are currently thinking. Clinical psychologists ask their clients about how they feel, think and assume other people see them.

Introspection is an important and necessary tool in all these examples. In this sense, it is already part of the Science 1 methodology. In fact, no part of science would function without scientists observing their own mental states and reporting what they observe. We see this when Galileo looked through the telescope and reported seeing the phases of Venus and the moons of Jupiter. All scientific observations and reporting are based on introspection. We have no other access to our sense perception other than observing ourselves in the process of doing so.

Introspection seems to be a normal and uncontested part of the research process. However, the standard way of exploring it is through our focus on an object that is "out there" in how we see the world or "in me" as part of a wish, thought or idea, etc. There are strategies that purify these perceptions and control for error. Observations need to be independently verified, i.e. someone else has to see the phases of Venus and the moons of Jupiter. This is the reason why science likes to forget about the fundamentally subjective source of its knowledge.

Psychologists have shifted to look at observable data like behaviour, physiological measurements and have allowed cognitive concepts to enter theories. As a rule, though, it is still introspection as if an object were observed. Questionnaires are supposed to objectify and "measure" cognitive or affective constructs as if they were a describable object.

Recently, methodology has seen a move to qualitative data in psychology and social sciences. Interview methods and approaches like discourse analysis are now acceptable. These methods rely on introspection on the part of the participant *and* the researcher. The researcher's conscious experience becomes an instrument of the research. These methods explore subjective worlds of meaning and individual construction of reality. In this way they do not try to depict an allegedly objective reality, which is probably an illusion in more than just psychological and social research.

What this shows is that introspection is already present in Science 1 methodology. The reason we argue for a special place in science for introspection is that if consciousness is actually a real aspect of our world complementary to matter, then under certain circumstances consciousness would be able to have direct access to aspects of reality.

Using a complementary dual aspect model of reality, we can imagine that there are two routes to knowledge of the world. The first is through the existing Science 1 methodology already developed. The second is through turning consciousness inward as in contemplative or meditative practices to gain direct access to and introspect some deeper aspects of reality.

This is the traditional way of contemplative, meditative or mystical traditions. It might also be a way of knowledge that shamans used to induce specific states of consciousness through certain rituals like the Ayahuasca ritual of the Indians in the Amazonas. Integrating at least part of this potential access route would move a Science 2 worldview into an expanded Science 3.

There is an assumption here based on the anomalous cognition database that consciousness is a reality in its own right. While it is connected to the body at least under ordinary circumstances, it is different. If this is true then turning consciousness inwards should be able to touch reality and disclose some truthful knowledge, perhaps about the deep structure of reality, similar to mathematics describing the deeper structure of our physical world.

We call this type of contemplative introspection *radical* or *direct* introspection. There is no such tradition in the West at all. The other introspective methods we have previously mentioned have had time to develop

and discuss their methodology, qualitative criteria and how to arrive at valid results. Standard or indirect introspection always has something to refer to and be shared with others. Galileo could lend his telescope to someone and allow them to see the phases of Venus. A qualitative researcher has the transcripts of the interviews, observation logs or video recordings, etc.

Radical or direct introspection has no standard practice except its own experience and potentially a written or narrated account of it. This makes it prone to the subjective bias of our preferences and prejudices, our likes and dislikes, our cultural, historical and political reasoning as well as our ability to use language to describe it. We have no methodology for ascertaining anything like truth value or probability. Such accounts are normally considered interesting but of little scientific value. An expanded Science 3 would have the task of developing the methodology for this. There are some ideas already presented such as recording or reporting the experience and being able to compare it with some potentially available intersubjectively available material or existing record.

If we assume that spiritual experiences are at the base of religious teachings then we can consider these teachings the results of repeated experiences. If other people have the same spiritual experiences, they will share the core of the teaching. This is a vital step from "I" statements into "we". An example of this is that if one person has an experience of interconnectedness and arrives at the moral conclusion that harming others is in fact harming yourself, this is of little consequence. If many people report the same experience and arrive at the same moral conclusion then this becomes a shared experience out of which a moral code evolves.

From a scientific perspective, a group of first-person accounts of the same experience have a similar status to repeated scientific observations. They report an experience of reality shared by many. The only, and important, difference is that this data comes from subjective experience and has no material substance as a reference, as far as we know.



Barbara McClintock FRS, Nobel laureate (1902-1992)

There are long traditions in the East with Buddhist psychology and Hindu philosophy using such approaches. The difference we propose here is in degree and method of approach. Eastern approaches have focused almost exclusively on spiritual experience and development of inner knowledge. Yet by only focusing on understanding the workings of the mind and relief of suffering they have neglected material reality. Western approaches of science emphasize our material reality, research it and make it useful. Together they provide the complementarity needed of a dual aspect model that enriches our scientific knowledge.

One of the founding fathers of modern psychology, Franz Brentano, wanted to build psychology and philosophy on a foundation of radical introspection. He was indirectly successful because he inspired Freud and the whole development of clinical psychology. This rests genuinely on introspection of both patient and therapist. Brentano also inspired the phenomenological movement. Edmund Husserl, the principal founder, was one of his students.

Brentano's direct attempts failed for a variety of reasons. One was personal. Brentano used to be a Catholic priest. He was in charge of writing the German bishopry's argument against the dogma of papal infallibility. This stated that the Pope could not be wrong when speaking on matters of faith because the Holy Spirit would not allow him to. When the Pope declared this to be true in 1869, Brentano left the church. He moved to academia but when he wanted to marry a Jewish heiress, he had to give up his chair in Vienna and move to Saxony to marry her. The government of the Catholic Habsburg emperor never gave him back his chair despite years of struggle. He never ended up writing the work he wanted to that would show how "Descriptive Psychology" would work. The other more systematic reason is that you need to have trained and dedicated participants who have learned how to introspect. They need to know how to focus attention inward and be able to hold it there for any length of time. Radical introspection consists of more than observing concepts arising in front of one's mind's eye.

William James is also another Western forefather of radical introspection with his concept of "radical empiricism". He wanted to make everything which occurred within the experiential stream of consciousness part and parcel of psychological study. James' attempt was not developed further. The rise of the behaviourist movement in the US quickly labelled references to internal states as "unscientific". This positivist approach only allowed introspection as a way of accessing internal behaviour. While our theories and concepts are no longer positivist, it is still powerful in the practice of life sciences and psychology. We have not had a methodology of radical introspection in the West because the initial attempts did not develop further.

Taking direct introspective knowledge seriously does not mean going back to older traditions as some types of New-Age science suggested in the 80s and 90s. It means developing a new methodology. Maybe this methodology will borrow some insights from older traditions and draw inspiration from them. The difference is that this methodology will be distinctly secular and embedded in the scientific tradition. As this happens the Science 2 worldview will change and develop into an expanded Science 3.

The idea of radical or direct introspection only sounds novel in the context of a Science 2 worldview. When we look at current scientific practice, we can actually see some first attempts. "*Contemplative Neuroscience*" is one of these. While these studies use a traditional approach to introspection paired with neuroscientific methods of observing brain activity, they still point to a shift in understanding consciousness.

Radical or direct introspection takes this one step further. We include systematic approaches of meditation or contemplation in the scientific arsenal. We develop methods to share, discuss and potentially verify the resulting experience to create common and potentially intersubjective elements. The first step would be an openness and acceptance of such approaches and a common understanding that this is an important potential new development.

## INCLUSIVE THINKING AND CLASSICAL LOGIC

Including radical or direct introspection may also complement logical thinking with inclusive thinking. Logic, as we stated, is a necessary basis for science. Without it we would be prone to all kinds of incoherent statements. But logic is not enough. It only applies to sentences and to predicative structures. Our bias towards this kind of thinking is likely cultural and is impeding creativity, innovation and insight. Classical logic operates via an "either-or" exclusion principle.

Inclusive thinking operates via a more-valued logic of "both-and". This recognises that there may be situations where logically exclusive alternatives appear to be applicable, but are actually wrong. Everyday experience is rich in examples. Most of the time our parents were both helpful and supportive as well as sometimes unempathetic and unsupportive. Part of growing up is to integrate these "both-and" perspectives into a realistic image of our parents. We can also see this in politics. Only in rare cases is it helpful to condemn the actions of others or to separate other nations into those that are "good" and those that are "bad".

The application of more inclusive thinking is already common in many branches of the social sciences. It is likely that it would help produce more sustainable solutions in politics and economics. It would be helpful in science to support discovery, solve problems and find creative solutions. Inclusive thinking can also be applied to the shift in Science 2 worldview to expanded Science 3. It is not either "science, objectivity, materialism" or "spirituality, introspection, consciousness". It is both. We need a clear intersubjective study of matter and an enlarged set of background assumptions that allows for the study of consciousness, direct introspection and the intersubjective scrutiny of first-person accounts of direct experiences of reality.

This would be a large step forward for our culture. It would impact a number of developments from political peace-keeping missions to economic developments, from education to university training. Many seemingly irreconcilable opposites would then dissolve such as economy and ecology, growth and sustainability, freedom and peace, taking care of oneself and being responsible for others. It would be an interesting task for an expanded Science 3 to explore the context in which a certain type of logic is appropriate. For this to happen though, Science 1 methodology needs to be separated from Science 2 worldview.

If spiritual experiences, or direct introspection, are going to be taken seriously then transcending binary logic will be necessary. It seems that these experiences are too rich to be put into simple sentences and submitted to exclusive logic. This is also the reason why many religious texts are full of contradictions. When we consider first-person experience of such accounts, the content is not expressible in simple structures. Experiences are considered to be "too big" to express. They are often clear but need time to be expressed. They also contain contradictory elements.

This may be because such direct, radically introspective experiences of reality touch upon the deep structures from within. Alan Lightman is a prominent American astrophysicist who is currently a MIT Professor of the Practice of Humanities. At MIT he was one of the first faculty members to have a joint position in both science and the humanities. Lightman considers himself an atheist. Once when he travelled to his island residence in a boat, he switched off his engine to look at the stars. He had a spontaneous experience:

*"I lay down in the boat and looked up. A very dark night sky seen from the ocean is a mystical experience. After a few minutes, my world had dissolved into that star-littered sky. My body disappeared. And I found myself falling into infinity. A feeling came over me I'd not experienced before. Perhaps a sensation experienced by the ancients at Font-de-Gaume [a cave with Palaeolithic painting he had described earlier]. I felt an overwhelming connection to the stars, as if I were part of them. And the vast expanse of time – extending from the far distant past long before I was born and then into the far distant future long after I will die – seemed compressed to a dot. I felt connected not only to the stars but to all of nature, and to the entire cosmos. I felt a merging with something far larger than myself, a grand and eternal unity, a hint of something absolute. After a time, I sat up and started the engine again. I had no idea how long I'd been lying there looking up."*

There are many elements here of experiences that are also reported by others: an experience of unity with something much larger; an experience of timelessness compressed into a dot; a feeling of connectedness with the whole cosmos. This is one of a modern-day Zen practitioner reported as part of a break-through experience from the collection of Harald Walach's own teacher:

*“Suddenly it appeared as if a door opened. Reality broke asunder, or, to be more precise, it did not break but it was as if a curtain was drawn apart. The very same reality showed itself in a completely different light, as it were, and it was clear as the sun, in the truest sense of the word, for, at the same time, I saw a miraculously bright light which was as bright as the sun but still did not blind me. It made everything appear clearly. It was clear as the sun that this is exactly the reality and at the same time separated from us by a wall of paper, although it is not separated... In Zen-terminology it was the true being – and I am identical with it. Within me and within everything else, there lives the very same light and I am it, completely identical with it. An incredible wave of joy, never experienced before or after, literally washed me from the path I was walking on... And I knew: this reality is reality itself; it is always there, only we do not see it. Suddenly I understood a lot, with an understanding that is happening, as it were, in a huge lightening of the now, and whose explication is still ongoing...”*

We see similar structures here: insight and connectedness; suddenness and understanding; light and the metaphor of bright light like the sun; the compression of the experience into a seeming dot or moment. These are in addition to the experience of joy. In both experiences there are contradictory structures: here and everywhere, individual and whole, now and eternity, time and duration, separation and connection. None of these fit the structure of binary logic.

Physics and quantum mechanics touch on the deep structure of reality from an outside approach. Radical introspection or spiritual experiences seem to do the same, using the route of consciousness. Systematic training of such practices through meditation, contemplation or any other practice of a culture of consciousness will enhance people's capacity to think in more inclusive terms.

## ENABLING ABDUCTIVE REASONING

A little studied and little-known process is already inherent in scientific discovery. This is the process of abduction: the way scientists creatively order different pieces of information and data into a new theoretical structure. It was the father of pragmatism, 20<sup>th</sup> century American philosopher Charles S. Peirce who invented the term abductive reasoning. This process is similar to the way that a detective pieces together snippets of evidence to understand what happened. In a circle of scientific reasoning, abductive reasoning is always the first step. This idea was first formulated by Aristotle who called it *“anachnoia – sharp sightedness”* and was made prominent at the beginning of the 13th century. It was already present at the beginning of Western theory of science.

Abductive reasoning refers to the first step in theory building. This is the actual finding and formulating of a particularly rich scientific theory. There are no instructions or process to follow. It is a creative insight into a deeper, underlying pattern that combines surface data points. This is then framed in scientific terms. It is like the process of connecting the dots in children's drawings. The difference is there are no numbers to pre-specify the image.

This direct insight into a deeper pattern is similar to the core element of radical introspection. In science this experience is often reported as “receiving ideas”. When Einstein said that his ideas “come from God” it was a way of explaining this process of insight. Nobel Prize winner Barbara McClintock visualised a way to study maize chromosomes. She spoke about the fact that she had an insight because she “merged” and become one with the cells she studied:

*“...and when I was really working with them, I wasn't outside, I was down there. I was part of the system. I was right down there with them, and everything got big. I even was able to see the internal parts of the chromosomes – actually everything was there. It surprised me because I actually felt as if I were right down there and these were my friends...As you look at these things, they become part of you. And you forget yourself. The main thing about it is you forget yourself.”*

The German physicist Werner Heisenberg was one of the key pioneers of quantum mechanics. In his autobiographical accounts he reports how the insight about ordering the data into the matrix formalism of quantum mechanics came to him after long walks and talks at the beaches of the island of Sylt in the North Sea.

These are only some examples of documented abductive reasoning by prominent scientists. A rich array of data and information is processed subconsciously and suddenly the underlying pattern appears. This can be reconstructed as a cognitive process that uses the pattern recognition of the right hemisphere. There can also be a direct intuition of reality such as the one described by McClintock. This shows abduction and direct introspective insights seem to be similar first-person experiences. There is a common basis between scientific understanding and direct introspection.

## EXPLORING A SCIENCE OF ETHICS AND VALUES

When applied further, radical introspection or spiritual experiences could also be a way to discover the deep structure of reality and moral absolutes, if there are any. Individual and personal meaning normally arises from insights into the structure of one's life. These come from making peace with events that were not in one's power or forgiving oneself for making a mistake, etc. The introspective experience we have creates the meaning we attach to an external event.

Something similar happens when we intuit values or ethical norms as absolute. We can read the “discovery” of ethics in classical religion like this. It's possible that the “commandments” given to Moses by God actually suggest a deeper experience of reality through direct introspection that was then shared with others. Other religious or spiritual traditions have similar ethical codices. People with near-death experiences often report receiving an understanding of moral absolutes and a framework of ethics deriving from the interconnectedness of all beings. The same is true for people with deep spiritual experiences.

What is completely unclear is whether this approach is even viable at all as a general strategy for the human population. We also do not know if it will produce moral absolutes. But as long as the path has not been tried, we cannot tell. Right now, there are two more or less separated worlds. A confused public is in the middle. One world still sticks to the religious and divine source of ethical commandments. This still holds some power in our Western cultures though it is likely this will wane as secularisation spreads. The other world is inspired by science and is trying a sometimes convincing, reductive approach to understanding moral and ethical behaviour as evolutionary principles. We do not need an “either-or” approach to moral absolutes. It is possible that they have developed from biological evolution and that they can be accessed directly through insight and radical introspection.

When we look at our world it is not necessary that everyone understands Einstein's equations or knows how to build an aircraft, for example. Perhaps it is the role of a few individuals who have the ability of radical introspection to make the discovery of moral absolutes and bring them into the cultural, political and religious arena. Processes would need to be created to critique, communicate and translate these insights in a way that others could trust. It is also possible that they would need to be revised in the context of changing cultural and political forces. A little disputed moral absolute is the respect for life, especially other human beings. Yet people are killed in wars, through capital punishment and crime. However, the way we express and enact this is changing throughout our world.

If there are any moral absolutes their intuition, expression and concretisation will change with time. Their nature will not. Exploring moral absolutes through radical introspection would be part of an extended Science 3. A possible way this may happen is through a more rigorous approach to gathering first-person experiences and then synthesising them into “we” statements. These could then be submitted to public critique where the values are discussed openly about which should be publicly sanctioned and which are private.

A good example is marriage and the special status of committed relationships. It seems to be a moral absolute that after a commitment to a partner one should only separate after much consideration. Humans of most cultures have honoured this by special rituals of marriage. There are also special rituals of separation. Following religious teachings, which may be an expression of a moral absolute, the state offers special rights and tax status to the marital relationship. Marriage was previously only allowed between heterosexual couples. Over the last five decades the bond between sexuality and marriage has loosened. Now, we have a broad spectrum of how intimate relationships can be expressed in our culture. Yet young people who shun the traditional rituals of marriage can be observed creating their own. Rings are worn on different fingers or couples get a tattoo as a sign of commitment. Locks are fixed to bridges and the keys thrown away similar to how initials were once carved into trees.

There seems to be a common intuition of the moral absolute of attachment, binding commitment and fidelity. This does have a biological and evolutionary aspect to it. It is easier to raise a child in a stable environment and also better for the child’s growth. Evolution will likely have selected for such traits in the first place. Whether reductive reasoning can explain the moral nature of attachment and fidelity is another question altogether. If they were completely biologically determined, then it calls into question why we do not have a universal social rule around it built into legislation and law. This would mean processes to take care of old, deserted mothers and rituals for fathers who wanted to start a new family, etc. That we do not have them suggests something else is at play. Radical introspection could complement classical empirical research such as studying certain types of relationships and their long-term outcomes through mixed methods. This would enable us to figure out what the moral absolute is here, how far it needs to be implemented and how it creates freedom and flourishing for humans. A complementary approach would also clarify how moral absolutes relate to culture and whether they are universal or not. There are many questions here that need to be answered, especially regarding our existing absolute presuppositions. Perhaps they are types of absolutes that we are experiencing through direct introspection and do not yet know this because we do not have the methodology in place to explore it. Until we open up the debate, commission methodologies and reports, we will not know.

This is clearly a challenging area as morals structure human behaviour. Whoever can define morals exercises a degree of power over social behaviour. We can see this in the negative examples of dictatorships, from Nazi-terror to less obvious examples of today. It would be wise to approach this field from a well-informed place. To assume that moral absolutes can be intuited by specially gifted moral experiencers and then brought back to the world of ordinary humans is dangerous. That we might make mistakes should not prevent us from approaching this issue with an open, yet critical mind. A double, complementary stance might be called for: curiosity and a critical stance, openness and scepticism.

Perhaps this approach will also work out that ethical behaviour should include the dignity of animals, the rights of the biosphere and curb human impulses of destruction and exploitation. Because of political pressure and economic considerations, this is already beginning to be enacted. An expanded Science 3 could provide a more rigorous approach to developing moral structures.

## QUESTIONS FOR REFLECTION

- How well are you able to think in systems?
- What role does introspection play in your work?
- How do your own morals depend on direct introspection?

# CONCLUSION

## TOWARDS A NEW SCIENCE AND A CULTURE OF CONSCIOUSNESS

*“It takes a huge moral commitment and courage to think less narrowly; yet without thinking differently no great discoveries are made.”*

~ Dr Iain McGilchrist

Acknowledging that consciousness cannot be reduced to brain activity is the most important and single most decisive step towards an expanded Science 3. This would allow for direct access to the structures of reality through the route of direct or radical introspection. These are both terms we offer as a replacement for the somewhat loaded term “spiritual experience”. It means that we might “see” or “experience” reality directly through a contemplative or meditative training, sometimes even spontaneously. This would include the experimenter and his or her personal practice. While such insights and experience have been relegated to the domain of religion, we suggest taking them seriously, secularising them, and including the methodology in the scientific arsenal.

The outcome is neither a scientific crypto-religion, nor a religious science. The outcome will likely be a broadened science that has integrated some elements that have formerly belonged to the remit of religion. This is through the secularised form of radical introspection. This will change both science *and* religion. Science will become broader in outlook and remit, integrating direct experiences of reality in its insights. Religion will become less dogmatic and more open to dialogue and discourse. It will remain the domain of religion to interpret, express and enable these experiences. It will remain the domain of science to discuss critically, scrutinise and purify experiential statements about reality, whether they come from sense experience and its derivatives, or from direct experience. This latter branch of experience will become a proper element of the methodology of science. It may take on a more active and a more prominent role in the future.

A culture of consciousness, where people at large start taking care of their own mind is a matter of mental hygiene. In the 19<sup>th</sup> century physical hygiene was the single most important step in medical progress. In the chaos and complexity of today's 21st century world, it is possible that a new mental hygiene movement is the necessary next step in our culture. It could prevent burnout and information overload while guaranteeing survival of individuals and the planet. In a more controlled, systematic setting it might also lead to a more enlightened and more creative type of science. Nothing special would have to happen. Only the implicit ban on consciousness and spirituality would have to be lifted in scientific institutions and practice.

Some big corporations have already started this move. Google has a “Search Within” program where company members can take some time out each day for meditation during work time. Many other large companies have followed suit or are in the process of doing so. In the UK the report “Mindful Nation”, commissioned and adopted by the British Parliament and House of Lords has alerted the public to the chances and necessity of a broader culture of consciousness.

The first studies of introducing mindfulness courses into student settings show promising results. Mindfulness interventions in schools show potential for improving cognition and learning. Mindfulness as a broader movement has caught the imagination of the wider public and of researchers that seek out ways of helping people deal with stress and burnout. It potentially answers a deep-seated desire to find calm, peace and meaning in an otherwise hectic and often empty everyday busy life.

The academic community as avant-garde to new ideas would be well advised not to close the doors of lecture rooms, laboratories and offices against such developments. A culture of consciousness is not only for people with problems of burnout and at the fringe of insanity as some people think. It can also be a very healthy exercise to enhance insight, creativity and cognitive capacity for academics. It will be necessary

for those who want to explore such modes of radical introspection and direct spiritual insight in order to broaden the view towards an expanded Science 3 and enrich the methodology of Science 1. This will not be a necessary demand for every scientist or member of the academic community but it might become a development that we would hope is seen with openness in the future.

The only really distinctive element that will help transform Science 2 worldview into an expanded Science 3 is the acknowledgement of the special role of consciousness. This automatically entails the acknowledgement that a particular direct introspective methodology, radical introspection as we call it, can become part and parcel of the arsenal of science in a broadened Science 1 methodology.

These developments can neither be forced nor will this be necessary until an open discourse about the Science 2 worldview is opened. Then the assumptions inherent within it can be openly and repeatedly challenged. Anyone who feels uneasy will be able to voice their opinion. Slowly, perhaps even swiftly, we could then start to change scientific culture and practice. All that needs to happen is for Science 1 methodology to be seen as different from Science 2 worldview and its assumptions of materialism, reductionism and empiricism.

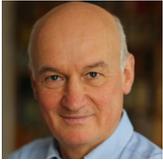
The world today is dominated by science and its underlying assumptions. As we have highlighted, these assumptions are seldom articulated even though they generate not only a methodology but also a worldview or philosophy. While scientific methodology is a set of evolving rules, socially negotiated among scientists, the Science 2 worldview has become a quasi-religious set of assumptions about the world, an ideology generally known as 'scientism'.

We fully support scientific methodology. We are critical of scientism. These concerns are well documented in scientific literature going back over 100 years. Both the Scientific and Medical Network, founded in 1973 and the Institute of Noetic Sciences, founded by the astronaut Edgar Mitchell in the same year were cultural responses to the dominance of scientific materialism. The founders of both organisations all had direct spiritual experiences that led them to question the limits of an exclusively reductionist and materialist understanding of reality. Their aim was to seek a wider and deeper understanding of life.

The concerns of the past are growing louder. In the 1990's, Willis Harman of Stanford University and President of the Institute of Noetic Sciences followed up the concerns against scientism with a major project on causality that included a re-examination of the philosophical foundations of modern science. Around the same time, the British author, journalist and academic John Cornwell arranged a series of meetings on Science and the Human Dimension at Jesus College, Cambridge. Many distinguished scientists and philosophers attended. The Journal of Consciousness Studies was established in 1994 with a wide remit on the relationship between science and consciousness together with the regular conference that is now called "The Science of Consciousness" to reflect the wide array of positions taken by researchers in the field. A group of scientists, of whom almost all the signatories can be found on the list of advisers for the Galileo report, formulated the Manifesto for a Post-Materialist Science in 2014.

At the same time, organised and militant scepticism is on the rise. It has taken over parapsychology and worldview related pages on Wikipedia and rewrites them from a sceptical angle. This includes the personal pages of researchers such as Rupert Sheldrake, Pim van Lommel, Charles Tart, Peter Fenwick and many others. Even the official page of the Society of Psychical Research has been taken over. Up to a third of the entry is fraud. Those who try to rectify this slanted view are threatened with a lifetime ban from Wikipedia. Although the group claims to be defending science and reason, they are in fact defending a narrow and dogmatic scientism. This intervention represents a form of epistemological censorship as well as being a deliberate slander on the reputation, character and integrity of the scientists concerned.

Just like the professor at Padua, who refused to look down Galileo's telescope they refuse to look at the evidence which exists. We stand at a critical point in science. The first scientific revolution in the 17<sup>th</sup> century ushered in an era focusing on the outer, matter, experiment, quantity, mathematics, mechanism and linear thinking. It created a level of growth and progress that has helped build the world we live in today. The contemporary 'consciousness revolution' redresses the balance in terms of the significance of inner consciousness, quality, experience, systems and complexity. What is possible in today's world when this happens? Perhaps we will see the proof of Nikola Tesla's alleged remark, "The day science begins to study the non-physical phenomena, it will make more progress in one decade than in all the previous centuries of its existence."



## HARALD WALACH, PH.D.

Professor Harald Walach is a researcher at the interface between medicine, psychology and consciousness studies. Currently he is affiliated as a professor with Poznan Medical University in Poznan, Poland, where he teaches mindfulness to the international medical students, and as a visiting professor with the University Witten-Herdecke's psychology department in Germany, where he teaches philosophical foundations of psychology to psychology undergraduates. He is founding director of the Change Health Science Institute in Berlin.

Dr. Walach holds a double Ph.D. in Clinical Psychology, and History and Theory of Science. He has authored more than 170 peer reviewed papers, 14 books and more than 100 book chapters. After a career building up a research group in complementary medicine at the University Hospital in Freiburg he held a research professorship with the University of Northampton, UK from 2005-2009 where he directed the MSc Program of Transpersonal Psychology and Consciousness Studies. From 2010 until 2016 he worked with the European University Viadrina in Frankfurt (Oder), where he headed a postgraduate Master program training doctors in complementary medicine and cultural sciences. His research interest is in methodology and evaluation of complementary medicine, the impact of consciousness on health, and a scientific approach to consciousness and spirituality. He is editor of the Journal "Complementary Medicine Research", associate editor of the journals "Mindfulness", and editor of the Springer book series "Neuroscience, Consciousness, Spirituality".



## TABITHA JAYNE, MSc

Tabitha Jayne is a professional coach practitioner and researcher into Nature connection and Earth connection with a specific interest in how it can help coaching evolve to meet the challenges of the 21<sup>st</sup> Century. She is the Director and Lead Coach at Earthself which offers leadership, team and organisational coaching with nature. Tabitha also trains coaches to use nature as a tool for transformational change in our collective transition to a sustainable world. Earthself's Transformational Change with Nature Coach Training Program is due to be submitted to the International Coach Federation (ICF) for Accredited Coach Training Program (ACTP) approval in 2021.

Tabitha received her MSc (Merit) from Middlesex University in partnership with the Alef Trust in Consciousness, Spirituality and Transpersonal Psychology. Her thesis *Earth Connection: Exploring Our Human Relationship with the Earth* was published in the Consciousness, Spirituality and Transpersonal Psychology Journal in its inaugural volume in 2020. Tabitha is also the author of *The Nature Process (2nd Edition): Discover the Power and Potential of Your Natural Self* and *Improve Your Wellbeing and Nature Embodied: How to Love Life*. Her research interest is in how the integration of coaching with nature can help leaders and businesses accelerate the evolution of business as a force for good. She is also interested in the interplay of consciousness and nature and how it can help humans develop both individually and collectively.

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Photo by Iain McGilchrist, Isle of Skye





Today's world is dominated by science and its largely unquestioned background assumptions. The Galileo Commission explores these background assumptions and the growing evidence base that challenges them. This evidence indicates that consciousness may go beyond the brain and the Galileo Commission explores what is possible for science when it expands its worldview in alignment with the data.

*"In the future, if we have one, our descendants will surely look with astonishment on a hallmark of our age: how we were duped by materialism, how our most brilliant scientists enthusiastically used their minds to prove that minds do not exist, and how they employed their consciousness in the task of proving that no one is truly conscious. A condition for our species' survival is, first and foremost, to survive the dehumanizing, paralyzing, suicidal scourge of materialism. The Galileo Commission Report is a powerful move in this direction."*

**Larry Dossey, MD**

Author: One Mind: How Our Individual Mind Is Part of a Greater Consciousness and Why It Matters and other books. Executive Editor: Explore: The Journal of Science and Healing

*"The Galileo Commission Report is a revolutionary work that serves as a "wake-up call" to humanity that there is more to this universe than our physicalist notions currently allow. This report is a well-written, comprehensible, yet thorough introduction to the big concepts and ideas surrounding a world view beyond physicalism and the necessity for humankind to broaden and deepen our understanding of consciousness. This report is a compelling call for us to re-examine the impact of our belief systems and assumptions on our work and to expand our scope, deepen our introspection, and apply our scientific curiosity towards a more comprehensive understanding of consciousness. The ramifications of such are too big to ignore."*

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