



GALILEO COMMISSION

SUMMARY REPORT

BEYOND A MATERIALIST WORLDVIEW

Towards an Expanded Science

Harald Walach

on behalf of the Scientific and Medical Network



The Scientific &
Medical Network

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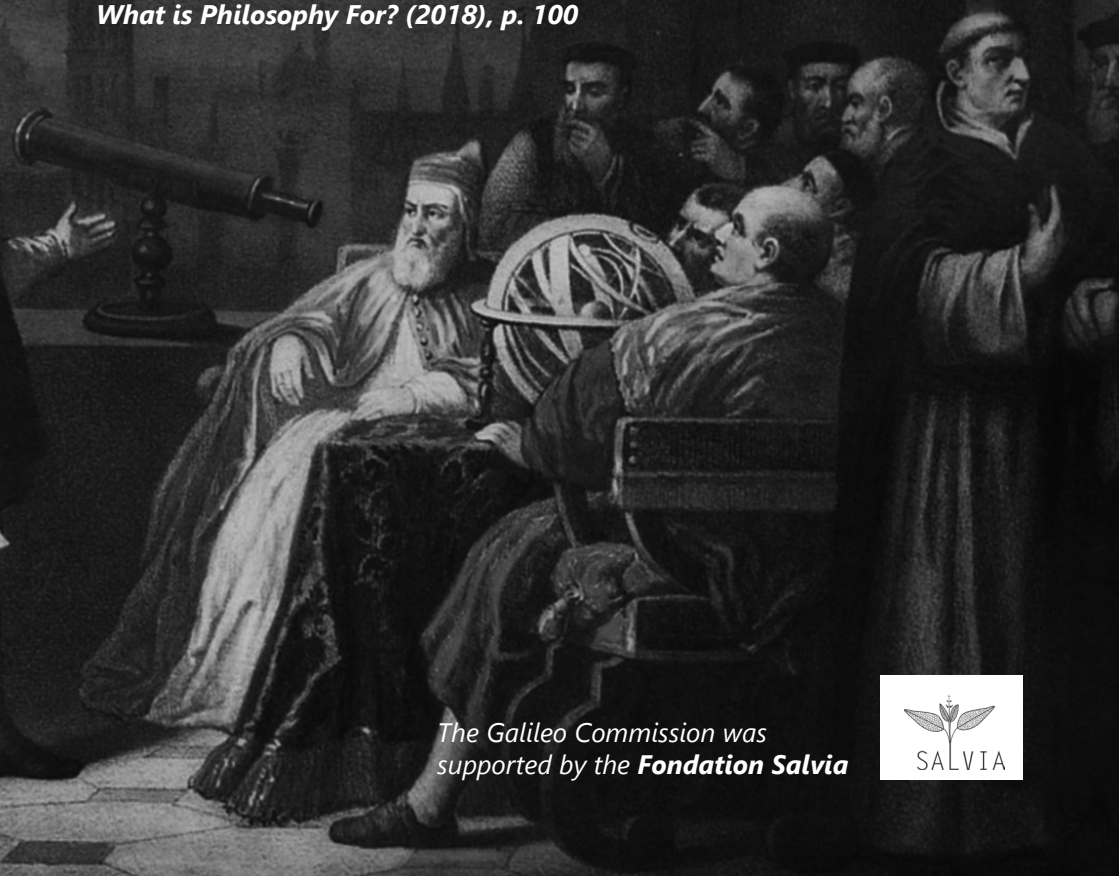
THIS REPORT IS DEDICATED TO THE MEMORY OF

MARY MIDGLEY

(1919-2018)

"This 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 the 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."

What is Philosophy For? (2018), p. 100



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Foreword - Science needs to be more scientific

Dr Iain McGilchrist



DR IAIN MCGILCHRIST

My unease about the presuppositions hidden in science was crystallised when I read Collingwood's *Essay on Metaphysics* while at school. This presented a radical critique of the then fashionable logical positivism advanced by AJ Ayer and the Vienna Circle, and prefigured the much better known book by Thomas Kuhn, *The Structure of Scientific Revolutions*, published in 1962. Kuhn alerted us to the 'paradigm' as a lens through which we apprehend reality, the problem being that, while such paradigms

are indispensable, we tend to be oblivious to the inevitably distorting effect of the lens. 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.

Scientific revolutions result in a reframing of previous knowledge in a new way. There will always be considerable resistance to revising a paradigm, especially if it has proved successful in many respects. But its success in those respects may blind us to its failure in others. That is always the danger.

The arguments contained in this summary Galileo Commission Report have been ignored by the science establishment, not because of their lack of merit, but because they would require a revision of the current, cherished, materialist, paradigm. I believe the main reason for this is fear.

Nowadays science is an industry, practised factory-fashion, with huge empires, awards and egos at stake, and dependent on vastly expensive machinery. No young scientist now dares step out of line if he or she wants a career, and the more established ones have everything to lose by doing so. As a result, true science is practised less and less.

It takes huge moral commitment and courage to think less narrowly; yet without thinking differently no great discoveries are made. Most of the great discoveries of science of the past were made by independent individuals working with only basic equipment and often alone (many were clergy).

They were true scientists, because they asked the important big questions and kept their minds open. This is harder nowadays. And broadcasters and journalists are afraid of appearing foolish by giving any credence to anything other than scientism, since that is what the establishment enforces (they are also now locked into huge, inflexible bureaucratic systems of their own). Meanwhile the humanities have lost their nerve, for a host of reasons, and just want to ape what they see as 'science', though what they ape is, in fact, scientism: the belief that all human questions can be answered by the application of a framework of reductive materialism.

The Galileo Commission Report makes the important distinction between scientism and science, and takes an inclusive, rather than exclusive, view. We all need healthy science. Without it, I believe, we are all lost – at least if any argument is to have purchase; and it is not as if the current science paradigm, deeply mistaken as I believe it to be, has met with no success.

Much as Newtonian mechanics is incomplete, it is very helpful in very many situations. The problem is in taking at all times the narrow view. For example, it is not that, taking the narrow view, agribusiness does not work: it's that in the broader view it is disastrous, because we don't see what it is that we cannot see.

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. What we want, in the words of the better US title of Rupert Sheldrake's "The Science Delusion", is "Science Set Free". Science needs to be liberated, not besieged.

How do you come to see what it is that your narrow vision, by definition, excludes you from seeing? Some people, perhaps most, cannot be helped: they will never look down the telescope. But there will always be some who will, and they need our encouragement. What makes the current science establishment particularly uncomfortable is any breath of inconsistency – a sure sign of moribundity, since it is only from inconsistencies that science advances – which has the perverse effect of discouraging any shifts in the paradigm.

The science establishment makes unscientific assumptions, an inconsistency ignored by the mainstream who assume that they make no assumptions. To take one example, there is no single shred of evidence that matter gives rise to consciousness, and some reason from contemporary physics to believe that consciousness is prior to matter. And, of course, the demand that science accept only what can be empirically demonstrated is itself not an empirically grounded or demonstrable demand. We need to ask the difficult, truly scientific questions, allowing people to see what they may be missing simply by being too narrow in their assumptions.

In brief, this Report does not argue that there is something wrong with science, but that 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 is a former Fellow of All Souls College, Oxford, an associate Fellow of Green Templeton College, Oxford, a Fellow of the Royal College of Psychiatrists, a Consultant Emeritus of the Bethlem and Maudsley Hospital, London, a former research Fellow in Neuroimaging at Johns Hopkins University Medical School, Baltimore, and a former Fellow of the Institute of Advanced Studies

in Stellenbosch. His books include ***Against Criticism, The Master and his Emissary: The Divided Brain and the Making of the Western World, The Divided Brain and the Search for Meaning; Why Are We So Unhappy?, and Ways of Attending*** (in press).



MARY MIDGLEY
(1919-2018)

Endorsements

Modern science has accomplished unprecedented goals in demonstrating the potential for humanity to understand and manipulate the world around us. However, much of its effect (i.e. science and technology used to wage war or enable injuring and killing others, as well as the wanton wreckage of our environment to the point of threatening great numbers of species with extinction, etc.) has greatly diminished the quality of life on our fragile planet, as opposed to enhancing it. The Galileo Commission report illuminates a refreshing path forward, all based in the modern science of consciousness, which offers hope for a more promising and fruitful future for all of humankind. Thanks to this report and the direction to which it points, scientific pursuits may once again lead the charge in achieving the grand aspects of human potential, through the wedding of human knowledge with the reality of human spirit.

Eben Alexander, MD

Neurosurgeon, author of Proof of Heaven and Living in a Mindful Universe

Harald Walach does a superb job in arguing for a broadening of science's self-conception beyond mainly materialistic paradigms and means. His reasoning is as useful for the future of science in time of deep change, as it is a huge challenge for all of us! A must-read for everybody interested in the future of our profession and the values and perspectives underlying it.

Roland Benedikter

Co-Head, Center for Advanced Studies, Eurac Research Bolzano/Italy, and Research Professor of Multidisciplinary Political Analysis, Willy Brandt Centre, University of Wroclaw/Poland.

Anyone seeking a thorough understanding of the controversy at the growing edge of science will find it in the Galileo Commission Report – it is a real tour de force! As humanity stands on the precipice of that growing edge, the Report will help to ensure that we will not fall back to the limited perspective that currently dominates Western culture but will move forward to a more holistic perspective that includes all the evidence at hand.

Professor Janice Holden, PhD

Professor, Counseling Program, College of Education. University of North Texas

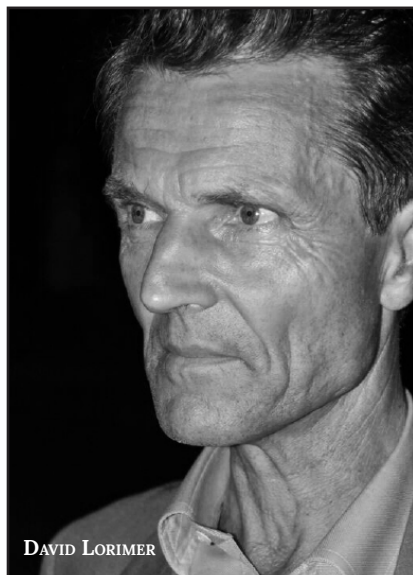
When I read the Galileo Commission Report, which includes the names of many highly respected advisors from the general scientific community, I was encouraged to see that the materialist view that consciousness is solely the product of brain activity has been challenged in a detailed, clear, and very convincing document. My hope is that the scientific community at large will consider this body of research, which is based on an emerging post-materialist scientific framework, in a thoughtful and professional way, and conclude that it makes a powerful case for consciousness as a primary element of nature rather than a product of biological processes.

Marjorie Woollacott, PhD

Professor Emeritus, Institute of Neuroscience, University of Oregon, President, Academy for the Advancement of Post-Materialist Sciences (AAPS).

Introduction – An invitation to look through the telescope

David Lorimer *Chair of Galileo Commission,
Programme Director, Scientific and Medical Network*



The Galileo Commission (www.galileocommission.org) is a project of the Scientific and Medical Network (www.scimednet.org). The Commission is represented by a distinguished group of over 90 scientific advisers affiliated to 30 universities worldwide, many of whom have been active during our consultation process leading up the publication of this Galileo Commission Report, written by Professor Harald Walach.

The purpose of the Report is to open public discourse and to find ways to expand the presuppositions

of science so that science (a) is not constrained by an outdated view of the nature of reality and consciousness; and (b) is better able to accommodate and explore significant human experiences and questions that it is currently unable to accommodate for philosophical reasons. We anticipate that expanding science will involve some new basic assumptions (an expanded ontology); additional ways of knowing and new rules of evidence (an expanded epistemology); as well as new methodologies flowing from these.

Within an expanded science, existing 'hard' science would still be valid in the contexts where it was generated. Many areas of research could still be profitably undertaken within existing materialist assumptions. But if science could be based on an expanded set of assumptions, and if they came to form the dominant philosophy of science, then that would open up new avenues and new possibilities. In other words, expanding science and its scope would transform our worldview.

In a letter to Kepler, Galileo wrote: 'Here at Padua is the principal professor of philosophy, whom I have repeatedly and urgently requested to look at the moon and

the planets through my glass, which he pertinaciously refuses to do' (Burt 1924, 66). Galileo continued that this professor laboured before the Grand Duke with logical arguments based on the authority of Aristotle. He added that Aristotle himself as an empiricist would surely have changed his mind on the basis of new evidence and observations.

This refusal to look through Galileo's telescope has striking parallels today. In the seventeenth century, the authority of Scripture and Aristotle were at stake; today the authority of scientific materialism is at stake as an adequate account of reality and life. For example, many scientists are unwilling to 'look through the telescope' at the evidence for consciousness beyond the brain because they have an unshakeable belief that consciousness is generated in and by the brain. However, William James pointed out long ago that there were three possible approaches to the relationship between brain and consciousness: that the brain produces consciousness; that it permits consciousness; and that it transmits consciousness with a 'filtering' function. He added that all normal research seems to support the first theory, that the brain produces consciousness, but that even the psychical research of his day provided evidence that this view was untenable.

An increasing number of sophisticated scientists and scholars familiar with historical and contemporary evidence are coming round to this view (e.g. *Irreducible Mind* edited by Kelly and Kelly in 2007; and *Beyond Physicalism* edited by Kelly, Crabtree and Marshall 2015). In answer to the objection that we do not know how the brain might transmit consciousness, one can respond that orthodox neuroscience does not know how the brain produces consciousness either; correlation does not amount to causation. The view that the brain produces consciousness is in fact a postulate or presupposition rather than a scientific finding.

Today's world is dominated by science and its underlying assumptions. Yet these are seldom articulated even though they generate not only a methodology but also a particular worldview, an ideology generally known as 'scientism'. The Commission fully supports scientific methodology that is underpinned by a set of evolving rules, socially negotiated among scientists, but it is highly critical of scientism – of assumptions maintained by refusing to 'look through the telescope'. We invite open-minded readers to do so.

Galileo Commission Report

Summary of Argument

1. No human intellectual activity, including science, can escape the fact that it has to make assumptions that cannot be proven using its own methodology (absolute presuppositions).
2. The prevalent underlying assumptions, or world model, of the majority of modern scientists are narrowly naturalist in metaphysics, materialist in ontology and reductionist-empiricist in methodology.
3. This results in the belief that consciousness is nothing but a consequence of complex arrangement of matter, or an emergent phenomenon of brain activity.
4. This belief is neither proven, nor warranted.
5. In fact, there are well documented empirical phenomena that contradict this belief. Among them are
 - a. Veridical reports of near death experiences (NDEs) with complex intuitions, perceptions, cognitions and emotions during well documented absence of brain activity.
 - b. Veridical reports of non-local perception that were confirmed independently during such near-death-states of absent brain activity.
 - c. The large data-base of parapsychology and anomalous cognition research shows in a series of meta-analyses that such non-local perceptions are indeed possible.
 - d. The large data-base of children who remember previous lives, some of whom have corresponding deformities.
6. An increasing number of open-minded scientists are already researching these frontier areas using existing scientific methods, and are reaching empirically grounded conclusions that challenge the mainstream majority view.
7. They therefore argue that we need a model of consciousness that is non-reductive and allows consciousness its own ontological status.
8. A minimum-consensus model is a dual aspect or complementarity model,

in which matter and mind, consciousness and its physical substrate, are two aspects of reality that are irreducible and simultaneously occurring perspectives of an underlying reality to which we otherwise have no direct access.

9. If that is granted, we can immediately see that consciousness can have its own direct access to reality, not only through sense perception, as in classical empiricism, but also through inner perception or radical introspection.
10. As a result, there may be a different and valid access route to reality, through consciousness, in addition to the classical one science is offering.
11. This might include direct access, under certain conditions, to deeper structures of reality, which may provide important insights into ethics, meaning, and values.
12. Indeed, insights from NDEs and other transformative experiences suggest that we are all embedded within a larger field of consciousness, with profound implications for ethics in an interconnected world.

13. Integrating an enlarged view of consciousness into science will also yield a new methodology that will have to be developed: the methodology of radical introspection or inner experience.
14. In view of the widespread perception that a narrow materialist world view is often uncritically passed on to young scientists by mainstream authorities as an adequate explanation of reality and as a pre-condition for a successful scientific career, we call for an open exploration of this topic and we encourage the scientific community to become more critically self-reflective of the absolute presuppositions on which their activities are based and to consider expanding their scope.



EXECUTIVE SUMMARY

FULL REPORT AVAILABLE AT WWW.GALILEOCOMMISSION.ORG

■ 1 Purpose, Motivation, Background

Every philosophy is tinged with the colouring of some secret imaginative background, which never emerges explicitly into its train of reasoning.

Alfred North Whitehead
1861-1947

This report aims to stimulate debate about the presuppositions, scope and shape of science in the future. It proposes that our current science is unnecessarily restricted and restrictive, and science and society at large would benefit from including areas, questions and topics into the remit of science that are currently actively and passively marginalised.

Among the topics currently excluded from the mainstream scientific discourse, apart from specialized niches like consciousness studies, are mainly those that take consciousness seriously as an reality in its own right. Examples of such topics would be spirituality and anomalous cognition, among others. By spirituality we mean an experiential access to dimensions of reality beyond the immediate environment and a life-orientation towards goals beyond the needs of the individual, and by anomalous cognition we mean cognitive and experiential access to domains of reality that are not causally connected to the individual as presently understood.

This marginalisation is, we will argue, not the consequence of a

lack of data, but a consequence of implicit, unexamined and hence powerful background assumptions that lead many scientists to assume the business of science is necessarily tied to the largely implicit acceptance of a materialist ontology or world view which is then dubbed the “scientific world view”.

This has the knock-on effect that young researchers are discouraged from tackling such topics, let alone building their careers on them, that funding agencies are reluctant to fund such projects, and journal editors and peer reviewers are more than critical when it comes to submissions and publications. A further consequence is that our culture at large has been drawn towards such a materialist world view in an unreflective and thus potentially dangerous way.

This attitude restricts the scientific discourse more than is necessary or helpful. It is in fact inhibiting innovation and the creative discovery of new solutions to perennial problems that many of the public and quite a few scientists, scholars and intellectuals feel are rooted in this very restricted mode of doing science and the technology derived from it. These include the global ecological crisis, decreasing biological diversity, the increase of chronic medical

problems related to lifestyle, social inequality around the globe and within Western societies, and global warming – to name but the most pressing issues. Some of these issues have to do with basic assumptions about reality and the overemphasis on quantity at the expense of quality and the exclusion of subjectivity.

**We propose that by
*expanding the mode,
scope and remit of
science we might
be able to create
an extended way of
doing science that is
both more humane
and more powerful in
serving the needs of
our planet as a whole,
and not just isolated
pockets of interest***



We are motivated by a deep commitment to the values and the history of the scientific project: carrying forward the process of enlightenment, enabling participation by as many people as possible in the benefits of knowledge, understanding the deep structure of our world and decreasing error and superstition. But we also argue that in order to achieve this goal it is necessary to open up a discourse about implicit assumptions underlying much of current science, and to challenge those assumptions that are unnecessarily restrictive. These, we suggest, are background assumptions about the deep structure of our world that act unconsciously and that therefore operate like a new crypto-religion.

Among these fundamental assumptions are that a materialist ontology is the only possible way forward. This implies that consciousness is a secondary aspect of reality, derived from matter or the workings of the brain. Another assumption concerns epistemology and is the consequence of the first: it stipulates that experience of our world, the major route to knowledge in science, is by definition experience of its outer, material aspects only. It neglects consciousness studies and largely rejects other avenues such as inner experience as reported in spiritual traditions or whole systems of introspective psychology, such as Buddhist or indigenous ways of gaining knowledge through participation in altered states of consciousness.

A corresponding methodological assumption is the idea that the analytical and reductionist method which works by decomposing larger entities into ever smaller ones and studying the smaller constituents is the best and only way to reliable knowledge. With it goes the prejudice that only what is quantifiable and expressible in numbers is scientifically valid. And often such a set of background assumptions comes with the idea that the scientific enterprise has proved the non-existence of non-material entities. This latter set of assumptions is very often

articulated together with other ontological and epistemological assumptions that have a quasi-religious commitment to a materialist world view, which is then dubbed the “scientific world view”. Quite apart from the fact that the proof of non-existence of anything is almost impossible scientifically – even with material entities – it is not within the remit of a materially oriented science to tackle non-material entities. Science may make non-material entities, such as the ether, or phlogiston, superfluous through the provision of alternative explanations. But the proof of non-existence of a non-material entity is logically and scientifically untenable.

Our challenge focuses on the implicit, unconscious and unreflective adherence of scientists to such a set of background assumptions, and calling this activity “science”.

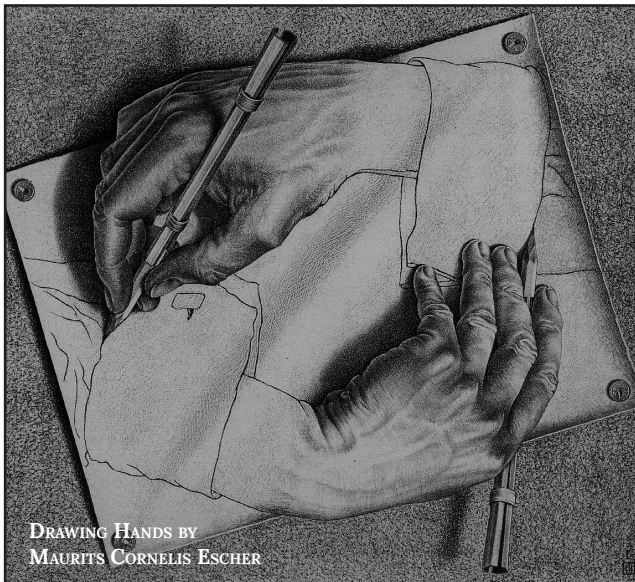
Here we would like to introduce a distinction for clarity’s sake: We will call the scientific endeavour to understand the world, with all its methodologies and its various modes Science 1. This describes the business of doing science and finding out about the world. We will call all the background assumptions about the world that are mostly implicit and largely undiscussed Science 2. Our quarrel is with Science 2 and with the consequences it has on Science 1. This is because we want Science 1 to be more aware and successful in its remit of finding out about how our world is actually structured.

This, we propose, is only possible in an innovative way if we challenge, make explicit and discuss the background assumptions, and bring the discourse about Science 2 into an open debate. This is the purpose of this report. Our hope is that this might enable a transitional Science 1B to arise, with an enlarged set of background assumptions 2B that also will have impact on how we are doing science and thus will eventually result in a new kind of Science 3. The purpose of this report is to open up this debate by analysing Science 2, presenting arguments and data about why it is too narrow and to lay out a roadmap to an expanded Science 3.

1 PURPOSE, MOTIVATION, BACKGROUND

Our argument is a luxury of sorts: only because our science has been so successful in many ways and has helped us to understand our world and dominate it are we in a position to pose these questions in the first place. And we hasten to add: we find the insights of our modern science extremely valuable and would in no way want to quarrel with its findings. We do not subscribe to any of the crypto-anti-scientific viewpoints, be they influenced by fundamentalist positions in intelligent design theories or climate-change deniers or similar groups. We simply envision a broader, less dogmatic, more open and therefore hopefully more effective science.

This report is structured in reverse order to standard scholarly writing: we first present our conclusions as a kind of executive summary in the following paragraphs. These will come without the later ballast of sidetrack, argument, data and references. Thus, the busy reader can read this first section and will become acquainted with our arguments and findings. The sceptical reader or the reader with a more detailed interest can then examine our arguments and data in the following chapters, where we reason in more detail, and present the arguments in full together with the data that inform them.



2 The Inescapability of Background Assumptions and their Status

The lesson is that even the attempt to escape metaphysics is no sooner put in the form of a proposition than it is seen to involve highly significant metaphysical postulates.

E.A. Burtt

If there is one single robust insight about systems of thought, inquiry and knowledge that can be called firm and secure, then it is the insight that there is no system whatsoever possible that can generate the legitimacy of its own foundation with its own methods.

This is true for philosophical systems of thought, and in philosophy led to the insight that there will never be a final argument of support ("Letztbegründungsproblem"). This is true for any axiomatic system and was formally proven by Gödel in his incompleteness theorem ("Unabschließbarkeitstheorem"). This is also true for science as a whole.

In order to function, scientists must make assumptions about the world and about how to best approach it in terms of methodology. Importantly, these assumptions, which the philosopher Collingwood called "absolute presuppositions" are not themselves within the scope of science and cannot be so by definition. In other words, science has to make assumptions but can neither prove nor disprove these assumptions using the characteristic methods the assumptions are geared to support. Exactly how those assumptions come into effect is a matter of intense philosophical debate and largely irrelevant for our purposes.

That science necessarily has its own set of assumptions that help it function, but do not themselves form part of the scientific enterprise is widely accepted among historians and philosophers of science. These assumptions can be compared to the air birds fly in or the water fish swim in or the ground we walk on. They are a precondition for flying, swimming or walking, but are not the activity itself.

By looking at the approaches of past cultures that are no longer extant, we can understand how such assumptions function. Within Western medieval culture, for instance – out of which our modern science arose – it was evident that the natural world was an expression of a divine creator and hence nature was studied as an approach to understanding and praising God. No one would have even considered the idea that the manifold diversity of the natural world could have arisen by itself. And, in the same way, the diversity of creatures was an expression of divine creativity and love for those beings. No one would have entertained the idea that this might have been the complex result of chance and selective biological processes. Thus, in the medieval world a creator God with all its entailments and the necessary cosmology of intermediate helpers and beings like angels and

demons was a clear given – an absolute presupposition – that required no further discussion.

As we know, a complex historical process has radically changed these assumptions. By “historical process” we mean a complicated interplay between discoveries, technological and political applications, and economic and social consequences that together create a slowly changing culture.

It is part of the narrative of Science 2 – science as a world view – to present this changing culture as a scientific breakthrough which came about solely as a consequence of scientific discoveries. Historically, this is only partly true. Therefore we prefer to say that the change in background assumptions was due to a combination of scientific discoveries, political and social changes that together created a changing cultural background which in turn informs the assumptions science is making. This gradually led to the point where today science no longer assumes that there is a divine creator or associated entities active in the universe.

On the contrary, nobody ever posed the scientific question: is there a God? Or are there angels? No one conducted a scientific experiment with a negative result, and as a consequence we would

now know that this assumption is false and therefore no longer believe in divine entities. It is rather that the cultural environment changed, and with it the background assumptions of science.

If we now project ourselves into the future in the same way that we have looked at the past, we might envisage a culture with quite different background assumptions that looks at the way we are doing science today in the same mildly condescending way as we are looking at scholars of the Middle Ages. Those ancient scholars were similarly sure that they would produce ever more understanding of the divine cosmos and ever more insight – to the glory of God – as we are sure today that we are going to be gaining ever more insight and understanding of the material world to benefit mankind.

And in the same way there might be a future generation of scientists and societies that operate from a different foundation of background assumptions and will generate quite different types of knowledge and insights. We propose that by discussing those background assumptions we might be able to hasten a cultural change towards a more insightful type of science.

We can also better understand the operation of background assumptions by looking at other cultures. The cultures of East Asia, to take a very broad generic viewpoint, used different background assumptions in doing their science. They did not focus on the outer, material reality, but on the reality of consciousness and the mind because they thought this was the most important reality in the world. From there they developed highly differentiated psychologies and philosophies, as well as logics and mathematics, by introspective and reflective methods only. Hence their science has given their adepts other insights derived from the studies of Yogis or meditators that are gradually also interesting Western researchers. But their outlook on the world is different. We would be reluctant to introduce any moral or evaluative distinction here, but merely note that it is different. With a well-trained consciousness one can achieve a variety of things as with an expertly-used telescope. The question here is not which is better but what is the consequence and what is the goal.

Background assumptions are always helpful in some ways, but also a handicap in some other ways. They both illuminate and restrict. They help us to structure the manifold ways in which the world can present itself to us and thus help us in seeing certain things, but also prevent us from doing or seeing other things. Background assumptions are both guideposts and filters for our perception of the world.

The point is that we cannot not have such assumptions. They are inescapable. However, we suggest that we can become more aware of those assumptions and how they guide and hinder us, in a collective reflective process. This in turn will help us make more informed decisions about our assumptions and their potential modification or amplification.



SUSAN STEBBING
(1885-1943)

3 The Most Important Background Assumptions of Current Science

Scholarly pre-commitments manifest themselves in the questions the scholar poses and in the type of category he uses, where, indeed, bias is especially hard to track down because it is hard to suspect the very terms one uses, which seem so innocently neutral.

Marshall Hodgson, quoted in *Sufism*, by Alexander Knysh, p 57

People see things from their own perspective, much of what they say adds up to comforting ideas or outright propaganda for themselves and the groups to which they belong. They believe their own propaganda because they cannot see that this is what it is: the bias is invisible because the angle which produces it is felt as normal, not as a perspective peculiar to a special group (you cannot see it unless you stand outside it).

Patricia Crone, quoted in *Sufism*, by Alexander Knysh, p. 231

At any given time, there is an active set of scientific assumptions, some primary, some subsidiary or held conjointly with others. We do not aim to catalogue all the assumptions underlying current science. However, we would like to point out the more important ones for the development of science. Such assumptions are, as a rule, operative in various domains. One such domain is ontology, the field of concepts about what exists, or the basic constituents of nature. Another domain is epistemology or the ideas about how we can gain knowledge about the world. Still another is the domain of ethics or what we hold to be good behaviour. Although not strictly part of science, decisions about background assumptions have ethical consequences, and hence ethics needs to be part of these deliberations. Subsidiary to ontological assumptions are presuppositions about cosmology or how the world came into being and how it develops. Subsidiary to epistemology are assumptions about methodology and various corollaries about how to employ methods. Subsidiary to ethics are codes of scientific conduct and morality.

ONTOLOGY: MATTER IS THE ONLY REALITY IN THE UNIVERSE

The prevalent background assumption in science about ontology, or what exists, is materialism. Current science assumes and is predicated on the primacy of matter. Historically, natural science came into being as a study of nature and originally operated on the background assumption that nature is an expression of a divine creator and that the discovery of the laws of nature would be to praise this creator. Hence physics was natural philosophy.

With the growing body of scientific knowledge, the idea of a creator seemed more and more superfluous until, eventually, another background assumption took over – the idea that matter can organise itself into being through a complex process of chance events and evolutionary interactions. It is important to note at this point that this was not a process that resulted from a clear scientific insight or experimental results but a complex social and historical process whereby we now assume that matter alone is sufficient to explain the world. This is certainly a good heuristic idea as long as

it can explain parsimoniously, with simple elegant theories, a wide variety of phenomena. It starts to become a problem when phenomena that do not fit with this assumption have to be neglected or marginalised.

Note that we observe here a subtle shift from matter as the objective of science – as all natural science by definition studies matter and its various expressions and forms – to matter as the only legitimate object of science and as the sole constituent of reality. This marks the shift from matter as scientific object to materialism as a philosophical stance or world view.

Note also that it is perfectly possible to do natural science, i.e. look at the various expressions of matter in this world, without assuming that matter is the only scientifically meaningful entity in the universe. But what has happened is that matter as the object of scientific study has been promoted to the metaphysical status of the sole basic entity in the universe. Out of this, materialism developed as a fundamental stance of Science 2, the "scientific world view".

A consequence of this assumption – and not of scientific findings, it is important to note – is the fact that most neuroscientists and many other people in our scientific culture and beyond assume that consciousness is nothing but a complicated form of material process that can be explained as the outcome of intricate neuronal interactions.

This follows from an implicit approach of modern science, reductionism, which is itself a methodological assumption. If the scientific method of reducing complicated phenomena to less complicated constituent ones – so-called ontological reduction – is a valid method then it follows that it is both rational and useful to reduce the apparently more complicated phenomenon, consciousness, to the apparently less complicated one, brain activity.

It is this consequence, and analytic predisposition, of materialism to reduce consciousness to brain activity which we consider the most restrictive, the most problematic and most dangerous extrapolation of current scientific assumptions.



ALFRED NORTH WHITEHEAD
(1861-1947)

EPISTEMOLOGY:**REDUCTIVE ANALYSIS IS
THE METHOD OF CHOICE
TO UNDERSTAND
COMPLICATED
PROBLEMS**

Reductionist analysis comes in two forms: it is a methodological stance that is then extrapolated to entities, and then becomes an ontological one. As a methodological stance it means that we approach complex problems best by getting to their root causes and by separating parts out of the big problem until we have a smaller, manageable problem that we can solve. So, if a car is broken, we check all constituent parts until we find the fault and then repair it.

However, analysis has also informed the way we think about the world at large. So we analyse larger entities into their constituent parts and deal with those. Conversely, we think that if we have solved the problems at a lower level of analysis or if we have understood the constituent parts, we can then rebuild the knowledge of the whole from the bottom up, through the understanding of its parts. We thereby assume that no information is lost on the way down as it will be regained on our way back up to the understanding of the whole.

This is the reason why we analyse matter into its constituent parts and seek out the “ultimate”, “indivisible” unit of nature, what the Greeks called *atomon* – indivisible – the atom. This is a guiding heuristic not only in physics, where scientists have sought the atom, then analysed its structure, and are now analysing the deep structure of the constituents of atoms only to find further entities that might still be divisible. This idea has also inspired chemistry to develop its knowledge about the chemical elements. It has guided biology in its search for the constituents of life. It was at the heart of psychology when exploring cognition and emotion. It is the guidepost of neuroscience, when it analyses the actions of neurons and builds models of neuronal activity. It was for a long time even the guiding principle of history by analysing the complex processes of political and historical influences in terms of the motives, actions and desires of powerful individuals.

One obvious downside of this mode is of course that we easily lose sight of the whole in the analysis of the parts. We know a lot about how cells function and how cells contribute to the life of an organism but this has not necessarily helped us in bringing all this together into a cohesive picture of the whole.

There is an important new trend in science, counteracting this tendency: complex systems science, operative in neuroscience, psychology, biology and other branches. This is inspired by the understanding that the complex whole is something different than its constituent parts. And we hope that our analysis will contribute to supporting such new approaches that counteract the still widely prevalent reductionist stance.

EPISTEMOLOGY:

EXPERIENCE IS
THE (ONLY) VALID
METHOD OF ARRIVING
AT KNOWLEDGE.
THEORETICAL ANALYSIS
IS PART OF IT

Experience is the principal method of science. It comes in two major distinguishable methodological forms: observation and experimentation. Pure observation is mostly applied by sciences like astronomy, geology, geography, zoology, botany, sociology and means observing what can be found to be the case or happening in nature without us intervening; experimentation involves studying the results of human intervention in a natural or artificial system in order to understand the underlying principles of the system in question.

In any case, experience is the common ground whereby we use our senses or artificial enhancers, such as telescopes, microscopes, immunological probes and the like, to gain knowledge about the world in its material aspects or how matter is constituted and behaves. We call this "outer experience" to distinguish it from a mode of experience that has as its referent not the outer world but the contents of consciousness itself, which we call "inner experience". The latter is included in the modern arsenal of scientific methods already in various ways, such as in introspection and "qualitative methodology" in psychology and the social sciences. But as such it approaches its subject matter from the outside as well, through observation and interviewing, even though the aim of these methods is understanding individual experience and meaning making. Inner experience in the sense of introspective knowledge or first-person experience is only beginning to feature in modern scientific methodology in some spearhead disciplines such as consciousness studies and contemplative neurosciences. It will be part of our inquiry to support this new move and propose further alternatives.

There is broad consensus that experience is the method of

science, and we would not want to question this. The only question we are raising here is this: whether a type of experience that is directed inwards and has as a referent the contents of the mind or of consciousness itself might not, under certain circumstances, also be a valuable mode of experience contributing potentially to scientific knowledge. This is highlighting again the original psychological questions that have been introduced by the founding fathers of psychology, for instance William James or Franz Brentano.

There is considerable debate, at least in the philosophy of science community, about whether experience alone is sufficient to secure knowledge. Some philosophers and thinkers have time and again pointed to the fact that

There is no such thing as experience independent of theoretical information: observation is 'theory-laden'. This is what we are actually in the process of discussing here. *We hold that every description of experience or observational statement is contingent on the theoretical framework within which it is made and only makes sense there.*

Another way of saying this is that there is no such thing as naïve sense experience without a presupposed theoretical frame, and that theoretical assumptions always have to be made. In that sense, rational and theoretical analysis is part and parcel of the scientific process of experiencing. In directing attention to background assumptions, we are simply taking this process of rational and theoretical analysis one level deeper than normally happens.



R.G. COLLINGWOOD
(1889–1943)

METHODOLOGY: LOGICAL ANALYSIS OF THEORETICAL STRUCTURES MUST USE BINARY LOGIC

Aristotle, who was the first to codify logic and the scientific method in the West, derived the fundamental principle of non-contradiction according to which something can either be in a certain respect, at a certain place and time, or not be. This forms the basis of our logic and is at the heart of algorithms in computers and elsewhere. It expresses itself in the cognitive structure “either – or”. Either a perception or experience is correct or not. Either a sentence is true or not. Either our theory fits with the data or not. Either our data are correctly analysed or not.

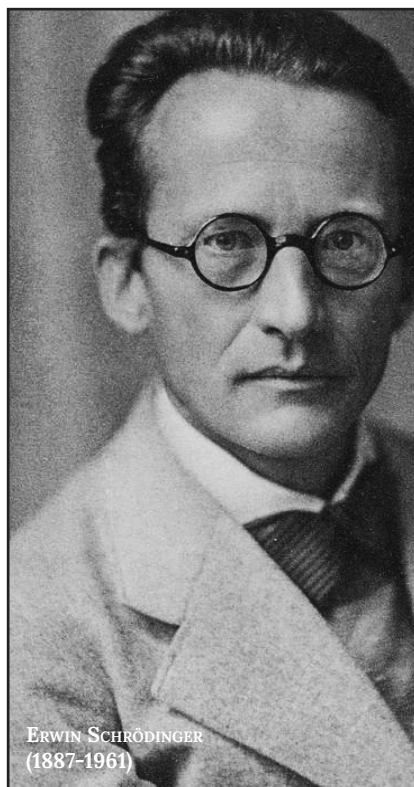
This “either – or” structure of formal logic was originally applied to the domain of sentences, predicative structures or logical arguments, where it fits and does us good service. However, we have extrapolated it nowadays into all kinds of other domains, where it may not be useful. In everyday life, for instance, it is often not helpful. Our relationships with people are complex and we like them in some respects and not in others. Or we

may need them and still not like them. “Either-or” psychological structures in everyday life and human relationships are very often a clinical sign of so-called splitting.

Very often Science 2 makes the mistake of extrapolating this logical structure into areas of life where it does not belong. Here are a few examples: in biology the debate around evolution hinges on the question whether evolution can be completely understood as a combination of random mutations and selection or whether there needs to be some design feature. Perhaps it is not an either-or question? Another alternative in this field is competition or cooperation as driving mechanisms of selection. Perhaps it is both? Some disciplines have been moving away from this limiting frame of thinking. It has become clear, for instance, that it is both the genetic make-up and its interaction with the environment that determine a phenotype. In psychology there was a vitriolic debate about the reality of unconscious processes and the validity of the claims of psychoanalysis. With increasing knowledge derived from cognitive science and neuroscience we see that this dichotomy is flawed.

More inclusive options have always existed and tend to be the result of more mature approaches.

Other cultures, including special disciplines in our culture, have developed three- or multi-valued logics that are more useful for concrete situations of life, and in fact Eastern ways of thinking are, as a rule, informed by more inclusive types of thinking. Within our own culture other types of rationality have been postulated and have also been empirically documented, as with relational and contextual reasoning by Reich, or integral consciousness by Gebser.



ERWIN SCHRÖDINGER
(1887-1961)

ETHICS: THE GOLDEN RULE AS A UNIVERSAL ETHICAL PRINCIPLE IS SUFFICIENT TO GUARANTEE ETHICAL AND HUMAN BEHAVIOUR

The common denominator of ethical rules across cultures, times and religions and the basis for political declarations like the Declaration of Universal Human Rights by the United Nations, is the Golden Rule: to act towards others as we would have them act towards us, or not to inflict any harm on others that we would not wish to have inflicted on us by anyone. This Golden Rule on its own, together with a utilitarian stance of maximising benefit for the largest number of people, seems for many defenders of Science 2 to be sufficient to guarantee ethical behaviour, peace and widespread well-being. In other words, defenders of Science 2 in its current implicit state have to rely on the power of reason and the sufficient reach of this rule.

Thereby they disenfranchise any transcendent realm – a transcendent God, or any transcendent moral principle of reward or punishment through something like rebirth, heaven or hell or suchlike, or any moral absolutes. They put ethics and morality in the hands of humanity.

Either they trust an enlightened citizenship to implement this rule, as Kant had expected, or they hope that legal systems and democratic governments will guarantee its implementation. This position is certainly a consequence of the secularisation resulting from the enlightenment as a movement.

There is at least one obvious blind spot in this reasoning: it excludes the rest of the non-human world. It cannot guarantee ecological equity or a fair attitude towards animals. The rights of animals are gradually coming into focus, because of scientific findings, but also because of fundamental changes in culture. In addition, the necessity of ecological perspectives becomes ever more obvious. However, various debates about climate change, reduction of ecological diversity and similar topics would be easier to resolve if our ethical principles were less grounded in an anthropocentric framework. Such an anthropocentric stance was originally derived from certain interpretations of religious teachings and kept informing Science 2 to a large degree.

We take the view that a broadening of ontology and epistemology, in the way we envisage, will also enlarge our shared ethical framework.



BARBARA MCCLINTOCK
(1902-1992)

4 The Limitations of Current Background Assumptions

Modern scholarship and modern science reproduce the same limitations as dominated the bygone Hellenistic people, and bygone Scholastic epoch. They canalise thought and observation within predetermined limits, based upon inadequate metaphysical assumptions dogmatically assumed. The modern assumptions differ from older assumptions, not wholly for the better. They exclude from rationalistic thought more of the final values of existence.

**Alfred North Whitehead,
Adventures of Ideas**

We will now examine the background assumptions mentioned above in more detail. They have helped us reach our current understanding of the world and hence have proved very useful. But they are also limiting to a considerable degree. We do not suggest changing and replacing them wholesale, as this would amount to a quite unjustifiable call for a completely new science. Our proposal is to extend and complement those background assumptions by broadening them or by questioning their dominance. This will happen automatically once the limitations and shaky foundations on which they rest become obvious. This is the purpose of this section.

The Limitations of the Materialist Background Assumption

While the direction of the focus of science towards the material world has been necessary and natural, the rise of materialism as a world view or as part of Science 2 is not. On the contrary, it is quite a limiting and inconsistent background assumption when it becomes materialism as a philosophy. The reasons are

twofold: first, materialism is inconsistent as an underlying philosophy, and second there are significant research data that are very difficult to reconcile with such a background philosophy.¹

The arguments that speak against materialism as a consistent philosophy or worldview are, briefly, the following:

Materialism works only by presupposing a conscious subject to formulate this philosophy in the first place. Hence, the materialist proposition works, if and only if the conscious subject proposing it can be proven to be nothing more than a material entity; or, more narrowly, if an explanation of consciousness can be given in purely materialist terms.

Materialists profess that such an explanation will be forthcoming in the future – exemplifying what Sir John Eccles and Sir Karl Popper called “promissory materialism” - and have been doing so since 1842, when the physiologist Emil du Bois-Reymond pledged he would find the material causes of consciousness. Some 180 years further down the path of history we still hear the same pledges. Although some hardnosed materialists would argue that this explanation has already

been achieved, most working scientists would not agree, nor do an increasing number of philosophers of mind.

**We suggest this
has a systematic
reason: phenomenal
consciousness cannot
be reduced to matter.**

The dualist intuition that Descartes introduced, whereby consciousness is categorically different from matter, is still very much alive, not for lack of attempts to overcome it, but seemingly because Descartes had grasped an aspect of truth: consciousness is not the same as matter.

Whether we need to subscribe to a substance dualism in the way Descartes did is quite another question. Other options are open to us, such as a dual aspect theory, as proposed by Spinoza and further developed by Leibniz. Other philosophies

¹ As mentioned in the Introduction, references and more stringent argument will be provided by the detailed parts that follow this Summary.

allow consciousness its own causal efficacy and phenomenal authenticity. We will not propose a solution but rather formulate a two-pronged minimal approach: the first arm of this approach is a refutation of materialism as a necessary and sufficient world view. The second arm is a kind of monistically neutral but phenomenologically rich dual aspect theory in which material and mental or conscious phenomena are both irreducible. They may or may not be part of the same underlying reality or arise from different realities.

Further and secondly, there are significant research data that speak against the adequacy of a materialist worldview. We will present and discuss them in detail in the sections following this Summary. There are extensive data from near death research. Recently more than 100 cases have been compiled from the literature that are difficult, if not impossible, to understand on reductionist-materialist premises. They all contain some anomalistic feature such as complex cognition after an extended period of apparent death with clear signs of absence of blood circulation for more than 20 minutes and with cognitive content that can be timed to have happened during a period of apparent unconsciousness. Some of these contain clairvoyant

or telepathic information that was independently verified. The sheer number of these cases makes it unlikely that they are all due to various artefacts, error, chance or confabulation. We therefore conclude that there is empirical documentation of multiple instances where there seem to be complex, clear and meaningful cognitions when – according to the reductionist idea of consciousness being identical to or causally dependent on brain activity – there should be none. Therefore, such a reductionist idea of consciousness does not seem to do full justice to the nature of consciousness.

Furthermore, although theoretically still difficult to explain, a large number of individual studies reviewed in various meta-analyses have documented empirical evidence of the veridicality of various anomalous cognitive experiences such as telepathy, clairvoyance, precognition and psychokinesis, all of them in experimentally controlled settings. While we would agree with sceptics that there are comparatively few independently and successfully replicated series of experiments, we would take issue with the view that they are therefore irrelevant.

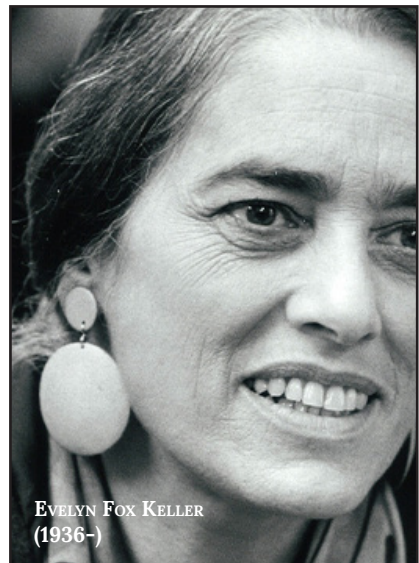
We rather take the view that this empirical pattern suggests that those phenomena are real but are not based on classical physical signals or causality, or, alternatively, that experimental systems cannot be isolated well enough such as to exclude the intention of the experimenter or participants.

Rather, we would argue that the meta-analytic evidence favours the veridicality of such processes.

While it is not impossible to create a materialist theory of anomalous cognition, some of these phenomena defy such an explanation and point to the fact that consciousness or mind has its own relationship to the world which normally is enacted via the body and by classical means but under certain circumstances seems to be able to reach beyond them.

Another empirical argument that rules out those epiphenomenal accounts of consciousness which deny causal efficacy to consciousness can be gleaned from the accumulating data from meditation research, hypnosis and similar fields. They show that a practice such as meditation is actually changing brain structure. Thereby, these data show that a practice and exercise focused within consciousness, such as meditation, acts on its own substrate, the brain, by changing its structure.

These philosophical arguments together with empirical data show clearly that materialism is no longer a viable background theory for science.

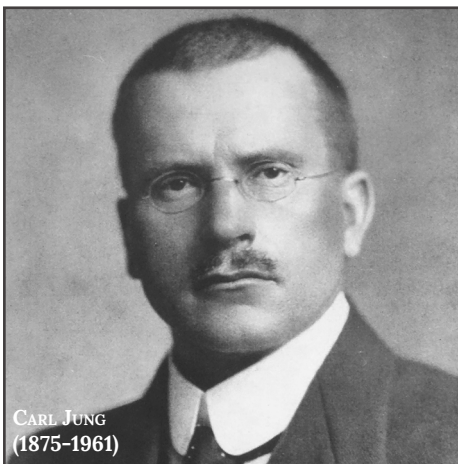


EVELYN FOX KELLER
(1936–)

ANALYSIS NEEDS TO BE COMPLEMENTED WITH SYNTHETIC AND HOLISTIC PERSPECTIVES

Reductionism is a wonderful conceptual tool to understand problems and to learn about the constituents of systems. It is a mistake, however, to assume that this is sufficient for a complete understanding. Systems theoretical approaches teach us that the whole exerts regulating and organising functions and thereby changes both the role and the function of the constituents of the systems. This has consequences in pharmacology, medicine and biology in general, but also in psychology and other areas.

Analysis without synthesis is only half the road travelled. The overemphasis of analysis over synthesis and holistic perspectives in some branches of science has led us to believe that knowledge of the constituents is sufficient to understand an entity.



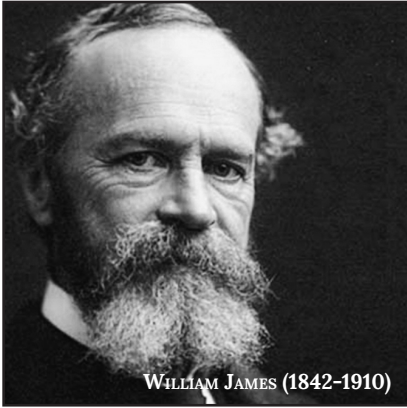
This is the reason why research is “mechanistic”, trying to understand how single parts are cranking together to generate the behaviour of a cell or organism. It overlooks the fact that in many cases there are holistic and systematic principles that exert a top-down influence for which there may not be a mechanism or mechanisms in the strict sense.

A pertinent example is the brain, where cognitive performance cannot be understood only by looking at local occurrences of activities in particular centres, but only by looking at the interaction with distant parts and with the whole activity. Our difficulty in understanding the binding problem - how different elements of a cognitive content such as the sound, colour and movement of a percept are perceived together as a unity - is an example of this situation. Holistic perspectives regarding the whole life of a patient and domains other than the one affected can also contribute to health and healing in a sustainable way and will help advance a more humane and more efficient medicine and healthcare. While this is accepted by many researchers, it has not informed many practices, for instance in medicine.

INNER EXPERIENCE CAN AND SHOULD BE PART OF THE SCIENTIFIC METHOD

It is quite correct and understandable that science has, historically speaking, approached nature with empirical methods, observing, experimenting and analysing the results.

It is critical to realise, however, that *all experience happens first and foremost as an individual act of consciousness* and only then is it transformed into intersubjective knowledge by various acts of quality control and purging of contingent and subjective elements, through discourse, critique and communication.



Roger Bacon in the 13th century was the first to demand a grounding of the totality of science in experience. He conceived of this notion as twofold – an outer experience directed towards nature and an inner experience directed towards consciousness. While the former has been used, honed and crafted into a powerful method of exploring nature, the latter has been neglected. At the beginning of scientific psychology, with Franz Brentano in Vienna, Gustav Fechner and Wilhelm Wundt in Leipzig, and William James in Harvard there were attempts at installing a scientific mode of controlled introspection as a scientific method. Those early attempts were swept aside first by the dominance of the experimental model and later by the rise of behaviourist approaches which were an expression of the tacit materialist

world view of their instigators.

While the external empirical method has had 500 years or more to generate and refine a methodology, and while this method has an uncontested referent, namely nature and the external world, inner experience or introspection has had only a short history in the West. In addition, its referent is more difficult to approach as it involves various states of consciousness and what they are referring to. It will therefore require an effort of methodological development to devise such a method.

However, by crossing cultural borders and taking in findings of Eastern psychology, we could improve our knowledge and increase our methodological purchase. One potential example would be current moves towards contemplative or phenomenal neuroscience, where highly trained monks from various traditions or specially trained participants can give introspective accounts of their experience and thereby enrich neuroscientific data. We will present other examples that enhance the plausibility that such an approach is useful and can enrich scientific knowledge and discourse.

We cannot deny the fact that we are only at the beginning of this process. We need an

epistemology, criteria for discerning truth from error, and ways of reliably arriving at an outcome, and some work towards this has already been done by pioneers. It shows that an open stance towards this mode of insight will bring various benefits. We will be able to make use of contemplatively gained insights and we might see an increase in scientific proliferation and triangulation or validation of introspectively gained knowledge by observation and vice versa. How we arrive at a fruitful scientific theory is, in any case, completely unclear. Once we have a good theory, we know what to do. But finding one is the challenge. It seems that the contemplative act of insight and introspection and the creative-intuitive act of finding a good theory are, at least in structure, similar processes which use identical routes of reflexive awareness and contemplation. Thus fostering contemplative approaches of mindfulness and introspection is not only a way of arriving at knowledge via another route, it is also a good way of enhancing scientific creativity in general. Both are likely to benefit science and society.

INCLUSIVE THINKING SHOULD COMPLEMENT CLASSICAL LOGIC

No one doubts the value of logic, since it provides a basis for clarity and internal consistency. While Aristotle defined logic as applicable to sentences, today we apply it to many other areas. This creates problems. Contrary to many, we think the problems do not arise because of a lack of logic and the logical binary mode of thinking, but because of too much of that type of thinking or by illicit applications.

The logical binary mode of thinking should be confined to where it belongs: analysis of scientific theories and their corollaries along with analysis of empirical findings and their consistency with theories. But whenever it comes to finding new models and whenever it comes to integrating findings into a larger picture, binary logic is often unhelpful. It is not so much that it is wrong, but more that it does not help. This has long been accepted by science studies where the logic of justification is differentiated from the logic of discovery. But this insight has as yet not reached the wider community.



JIDDU KRISHNAMURTI AND DAVID BOHM

We need a more inclusive type of thinking that can proceed in the form of “both-and”. This type of thinking arises from the insight that in complex situations there is rarely a clear cut alternative that can be decided upon by logical or empirical means. Inclusive thinking recognises that for complex problems seemingly contradictory approaches often need to be applied together.

One example is self-motivation, where we need to be strict with ourselves but at the same time to some extent lenient and supportive as well. Another example is education, where we need to give children freedom and at the same time structure. Approaching such situations with an either-or attitude is not helpful. The same is true for scientific reasoning. Had less exclusive binary reasoning and

more inclusive reasoning been employed, many detours could have been avoided in the history of science. A good example is the long-held separation of the immunological, endocrinological and neural systems in the body, and the variety of biochemical receptors. While exclusive thinking led to the doctrine that the immune system, the endocrine system and the neural system are separate we now know that practically all immunological cytokines will have neurological effects, and that practically all hormones are also neurotransmitters, and most neurotransmitters also function as hormones. In the same vein, the doctrine that neurotransmitters can have only one function is also wrong. They can have many functions, depending on the type of receptor.

WE NEED AN ETHICS THAT INCLUDES NON-HUMAN BEINGS AND A MORALITY THAT GOES BEYOND POLITICAL CONSENSUS

Our current ethical consensus is still largely based on our Christian heritage in the West and in a way of speaking we are living off that cultural capital. Although secularised, it is based on the Golden Rule that we should act in the way we would others have act towards us, and thus we should not harm others as we would not want them to harm us. It is often complemented by the utilitarian rule that actions or political decisions should be such as to maximise benefit for a majority.

While these are good rules to base human concerns on, their historic origins do not guarantee their endurance and they are insufficient when it comes to supporting and protecting the planet as a whole and the lives and subsistence of animals and plants. The implicit anthropocentrism of this ethical stance comes less from the Judeo-Christian faiths, as many surmise. It is rather a consequence of the early modern shift towards placing the human being at the centre of interest in the new cosmic story.

In a theocentric cosmology, where a creator and saviour God is at the centre of human thinking and striving, as was the case until the early modern period, nature has to be considered an expression of the Divine and hence must not be endangered. Only the early-modern shift towards anthropocentrism sought to justify this with theological argument. For it is part and parcel of the scientific project with its narrative of dominating nature, as initiated by Francis Bacon, to allow humans to put themselves at the top of the hierarchy of existence and hence to also exploit nature regardless of the consequences. This mindset is still at work, as for instance in Brazil when forests are felled and burned to provide grazing land for cattle to feed the appetites for beef of a growing bourgeois middle class all over the world.

Part of this stance of anthropocentrism is also a subtle narcissism that places oneself, or one's group or nation, at the top of the implicit hierarchy, slightly more important than others. This is visible in current political strategies, in nationalisms all over the world, in reckless dictatorship and leadership, and in uncompromising political competition. Although these various forms of egotism are incompatible with the Golden Rule, they are compatible with anthropocentrism.

It is obvious that different foundations for ethical and moral behaviour are needed. It is not really possible to go back to an external guarantor as many fundamentalist movements do, be this a God, or a guru, or a strong leader. We suspect that Science 2's weak ethical foundation within the materialist worldview is exactly the reason why fundamentalist and separatist movements are carried along by such a strong current. Notably, Islamist terror groups claim exactly this reason for their aggression against the "Godless West".

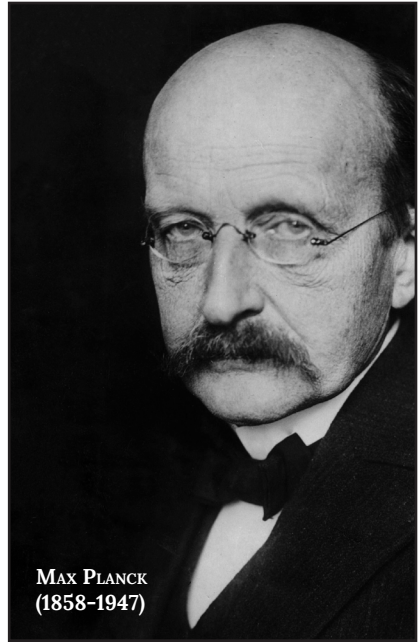
But how can we regain the high moral ground without taking refuge in transcendent or higher entities? Political bargaining does not seem to be sufficiently reliable and is much too vulnerable to sectarian interests and pressure groups to provide a solid ground. But an introspective orientation might help. If it is true, as various spiritual traditions are teaching, that ethical and moral norms come from deep contemplative insights, then this might be a way of securing ethical knowledge independent of external authority.

Experiences derived from meditation and other spiritual practices and inner paths provide individuals with experience of meaning and purpose in their lives. We propose seeing this as the invisible foundation of an individual life that can be discovered or disclosed introspectively.

We suspect that something similar happens on a broader scale: if we practise a contemplative, introspective way of knowledge then what we see and experience is the inner fabric of the world. Physical theorists discern the underlying mathematical structures, as did Kepler, Einstein and Heisenberg, and others working in the Pythagorean tradition. Inner seekers may discern the moral and ethical fabric of the world, as seems to have been the case with some extraordinary individuals in the

Axial Age and again today. It may well be the case that establishing a deeper basis and making this resource part and parcel of the scientific endeavour might enhance our integrity as a society and give a firmer foundation to ethics and morals beyond the strife and struggle of sectarian interests.

Furthermore, such an approach might generate a universal ethic of inclusiveness and interconnectedness that extends to animals, plants and the whole ecosphere. And this may, eventually, be the path to salvaging our planet and securing our continued existence.



The Way Forward: the Emerging Shape of a New Science

I regard consciousness as fundamental, matter is derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness. There is no matter as such; it exists only by virtue of a force bringing the particle to vibration and holding it together in a minute solar system; we must assume behind this force the existence of a conscious and intelligent mind. The mind is the matrix of all matter.

Max Planck, 1931

We have already hinted at some of our proposed solutions above and pull them together here to sketch out the shape of an enlarged, complementary science. We reiterate: it is not our intention to oppose or devalue our current science. On the contrary, we value it for the many exquisite insights and the superb technological advances it has made possible. But we feel that our whole scientific enterprise would benefit from an open discussion of the downside of its current restrictions and a broadening as we propose here.

We envisage a new form of science, with a new set of assumptions, forming what we have termed Science 3 or a trans-modern science. We can also call it spiritually informed or spiritually open science, as it will draw not only on traditional modes of experience, but also on inner, subjective experience in a methodologically robust sense. It would support most forms of current scientific practice and would encourage other forms that are either currently not part of the scientific portfolio or are only marginally accepted, often in the face of explicit resistance from mainstream scientific institutions.

The only thing it would not support is a materialist ontology that does not acknowledge its status as an implicit scientific background view but poses as science as such; this is scientism or scientistic philosophy rather than science. A spiritually informed science would oppose the implicit equation science = materialist ontology.

It would certainly allow adherence to a materialist ontology and way of doing science, should one choose to do so. But it also allows for other stances. It does not allow and contests stances where "scientific" implicitly and peremptorily includes "materialistic" in its predicate without saying so explicitly. Should science really vindicate such a materialist stance through a combination of experience and

analysis this would then be the consequence of the scientific process. In contrast, we deny that this has already happened, and we propose that this cannot and will not happen for empirical and analytical reasons.

Science 3 will include and incorporate the insight that consciousness is an entity that is not fully explicable in terms of the analysis of material systems alone. Exactly how it can be conceived we do not know and this will be open to debate and analysis. We propose that a minimal condition, as explained above, will be a dual aspect theory. Such a model will treat mental systems, and material systems like brains, as two different descriptions, neither of which can be reduced to the other. Science 3 would intuitively exclude monist models that are reductive, such as a materialist one, but also an idealist monist model. Monist models encounter the difficulty of explaining how a categorically different entity can arise from another one. We do not think that emergentist models that make consciousness contingent on and the result of the complex organisation of the brain really present a viable alternative. All emergent phenomena we know of are emergent phenomena within the same category, i.e. phenomena of material complexity. But consciousness is not of the same

category – it is categorically different. It is a category error to suppose otherwise.

Therefore, we need to assume, as a minimal point of working consensus, *that consciousness is an entity in its own right, perhaps co-arising with material phenomena or presenting the inner aspect of material organisation.*

Perhaps it is even an ontological reality in its own right and some form of dualism is its best expression. At this point we would not want to foreclose the debate.

But the methodological consequence of this position is that the study of consciousness and methodologies to train and shape consciousness are

part of this enterprise. This is already happening. The study of mindfulness is a good example. Originally starting as a stress reduction strategy, mindfulness techniques have become an intense focus of interest also for basic researchers and neuroscientists.

This was made possible because the originator of this movement, Jon Kabat-Zinn, divested meditation and mindfulness of its original religious context and secularised it. Many bemoaned this, but it was certainly the precondition for finding broad acceptance. Now it is a large movement generating a great deal of interesting data. Neuroscientific studies have shown that meditation impacts the brain, and studies with well-trained meditators have shown that they have capabilities that novice subjects lack, for instance in concentration, time stabilisation or introspective differentiation.

This can teach us two things: it provides us with some clues as to why the original move towards introspection at the beginning of psychology in the 19th century did not work. This was probably due to the fact that the test subjects were not well enough trained. It also tells us that if we include the training of consciousness, as incorporated in contemplative practices, into the design of scientific studies then we

are likely to gain greater insight. This can be achieved by scientists embarking on such training for themselves, something that is currently happening at an ever larger scale, or by working with well trained subjects.

At any rate, the study of consciousness – the explicit focus of inner experience – and the training of this focus will become part of this science and will add to and enrich information which we obtain from neuroscientific studies. Contemplative practice, or more broadly speaking a culture of introspective consciousness, will therefore become an additional tool for scientists and their subjects. Not everybody will be interested in this, nor is this necessary. It is sufficient if some are and if they are received supportively into the scientific community instead of with scorn and ridicule. New methods and insights will be generated around this move.

The decisive point to us seems to be that these movements and practices need to be possible *within* science and not banned from its discourse.

If this were the case we would see another rift in society or in science, creating new countercultures. It is therefore necessary for science to broaden out and include, for all the reasons mentioned above, contemplative spiritual practices or practices of a culture of consciousness and meditation within its remit. This could happen within certain specific curricula. For practical purposes this is already happening, for instance at the Oxford Centre of Mindfulness, where cognitive therapists are trained to include mindfulness in their methodology of depression treatment. It could happen on a broader basis if the wider scientific community were more open.

A methodological consequence would be that we would be initiating a programme of systematic introspective knowledge. Part of this would consist of approaches that are already being used in various pockets of science such as in the psychology of ecology or consciousness, where methods of radical first person inquiry are used, or participatory types of research.

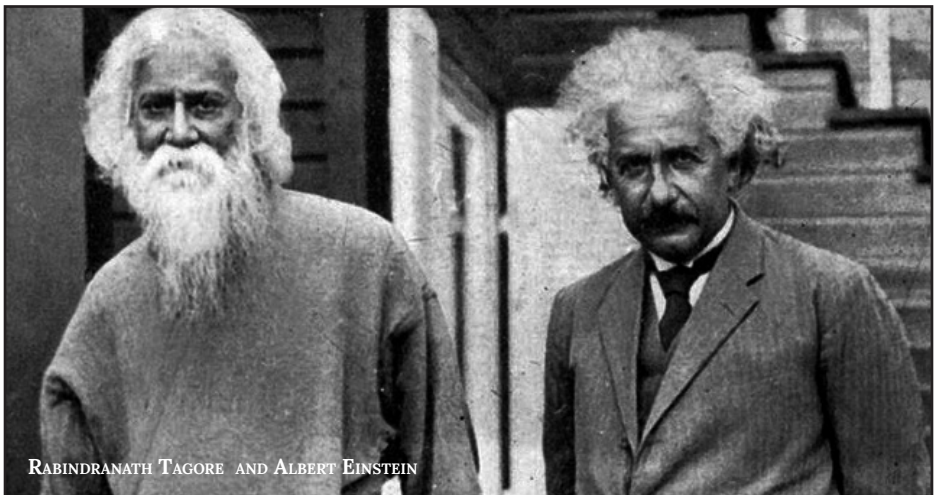
But a massive cultural consequence would be the fact that materialism as a world view would cease to be able to claim the adjective “scientific” exclusively for itself. Scientists and

other individuals would be free to call themselves materialists and subscribe to such a world view and it is likely that many would. But the social and political perspectives would likely change, and the implicit materialism in our societies might decline. This does not mean a return of religion into science or a return to creed-bound ways of doing science. We cannot and would not wish to turn back the wheel of history. But it would in all probability mean that spirituality as a human form of experience would become part and parcel of the scientific discourse and fabric in the same way as gender or sexuality.

At any rate Science 3 would be much broader in scope, more inclusive instead of exclusive, less sectarian and more

culturally diverse. Such a science that is not committed to a materialist ontology would have much wider appeal to many other cultures and would also be able to include approaches that are already available in other cultures.

This would mark an end to the dominance of Western styles of thinking as the only viable and scientific way. Ironically, this might turn out to be the only chance to save a distinctive Western style and, incidentally, the only way to save the planet: part of the reason why our planet is in its current condition is due to the dominance of an overly narrow Western style of thinking and its claim to be the only viable way of doing science. It isn't. There is more to it, and the main report spells out how and what.



RABINDRANATH TAGORE AND ALBERT EINSTEIN

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".

The Scientific and Medical Network www.scimednet.org

The Scientific and Medical Network is a worldwide professional community and membership organisation for open-minded, rigorous and evidence-based enquiry into themes bridging science, spirituality and consciousness. It brings together open-minded and discerning people who are inclined to a non-materialist interpretation of the universe and who have a sympathetic interest in parapsychological and spiritual matters covered in the Galileo Commission Report. The existence of the Scientific and Medical Network is an indication that there is a significant minority among professional people who wish to take fully into account the existence of a fundamental spiritual reality and the implications of the spiritual capabilities that we all possess.

The Network is part of the contemporary quest for a more spiritual mode of thinking and being that is compatible with science. *Hence it promotes a greater acceptance by science and medicine of the human being's spiritual essence, as consistent with science.* As such the Network challenges the adequacy of an

exclusively materialistic approach to reality as a sufficient basis of knowledge and values.

The Network is committed to advancing human perceptive abilities and acknowledges the complementary roles of scientific, artistic and mystical ways of knowing. In its work it seeks to harmonise intuition and logical analysis, heart and head, emotion and reason, subjective and objective, contemplation and action, the experiential and the intellectual.

This process of integration leads to a widening of experience and awareness resulting in a corresponding widening of our framework for understanding reality. The Network believes that growing knowledge and understanding can be attained by a more profound exploration and disciplined examination of key questions. This also requires deep sharing through creative listening and communication through silence, leading to a fellowship based on mutual trust and respect.

The Network seeks to provide a forum for pursuing truth, wherever

it leads, to widen the intellectual horizons of science and of society as a whole, to stimulate research at the frontiers of human knowledge and experience, and to make the results of such research more widely known through its educational programmes.

The Network is committed to no dogma or creed. It encourages intellectual discernment and is wary of the ill-founded and sensational claims of 'pseudo-science'. In asking searching questions about the nature of life and the role of the human being, the Network abides by its guidelines of open-minded, rigorous thinking and care for others at all times.

The founders believed that neither orthodox religion nor conventional science were, in their current forms, sufficient to answer pressing questions about our existence and about the mysteries of the cosmos, and that new ways of thinking, and new interdisciplinary approaches were needed to build bridges and to search for new approaches.

Resources

Manifesto for a Post-Materialist Science
www.opensciences.org

Institute of Noetic Sciences
www.noetic.org

The Society for Scientific Exploration – SSE
www.scientificexploration.org

Alister Hardy Centre for the Study of Spiritual Experience
www.studyspiritualexperiences.org

British Psychological Association – Transpersonal Psychology Section
www.bps.org.uk/networks-and-communities/member-microsite/transpersonal-psychology-section

British Psychological Association – Consciousness and Experiential Psychology Section
www.bps.org.uk/networks-and-communities/member-microsite/consciousness-and-experiential-psychology-section

Royal College of Psychiatrists Spirituality and Psychiatry SIG
www.rcpsych.ac.uk/workinpsychiatry/specialinterestgroups/spirituality.aspx

The Society for Psychical Research – SPR
www.spr.ac.uk

The Parapsychological Association
www.parapsych.org

The Academy for the Advancement of Post-materialist Sciences
www.aapsglobal.com

Galileo Commission

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Prof Ed Kelly, cognitive neuroscientist, University of Virginia
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Dr Cassandra Vieten (US), psychologist, Institute of Noetic Sciences
Dr Alan Wallace (US), physicist and Tibetan monk, Santa Barbara Institute
Dr Joan Walton (UK), consciousness researcher, York St John University
Prof Marjory Hines Woollacott, (US), neuroscientist, University of Oregon
Dr Michael Wride (Ireland), biologist, Trinity College, Dublin

Galileo Commission Report

Endorsements

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 Report challenges the materialistic position head-on, and sets out to examine the evidence against it, and the belief structures of our current scientific community. As Galen Strawson, academic philosopher at the University of Texas said:

"This particular denial (of the existence of consciousness) is the strangest thing that has ever happened in the whole history of human thought."

The completion and circulation of this report is both timely and important in helping to demonstrate the illogicality of our materialistic culture.

Dr Peter Fenwick, MD, FRCPsych

President, Scientific and Medical Network

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.

Jennifer Kim Penberthy, PhD, ABPP

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