

RELIGIONS / ADYĀN

A Scholarly Journal Published by the Doha International Center for Interfaith Dialogue

Religions/Adyān is an annual and bi-lingual (English and Arabic) publication in interfaith studies published by the Doha International Center for Interfaith Dialogue with an emphasis on interreligious dialogue and the relations between Islam and other faiths.

In a world of religious misunderstandings, violence, and hijacking of religious faiths by political ideologies, Religions/Adyān intends to provide a welcome space of encounter and reflection upon the commonalities and shared goals of the great religions of the world. The title of the journal suggests religious diversity while suggesting the need to explore this diversity in order to develop keys to both a deepening of one's own faith and a meaningful opening to other creeds. The Qur'ān suggests a commonality of faith and a striving for the Truth within the context of religious diversity:

"To each among you have we prescribed a law and an open way. If God had so willed, He would have made you a single people, but (His plan is) to test you in what He hath given you: so strive as in a race in all virtues. The goal of you all is to God; it is He that will show you the truth of the matters in which ye dispute." (The Table Spread 5:48, version of Yusuf Ali)

As a refereed international publication published the Doha International Center for Interfaith Dialogue, Religions/Adyān finds its inspiration in the universal message of monotheism broadly understood, while engaging the various religious faiths that share common principles and values within this broadly defined context.

Religions/Adyān encourages comparative studies and interreligious exchanges in a spirit of dialogue and mutual enrichment. Its aim is to promote understanding between religious faithful of various traditions by exploring and studying the rich field of their theological and spiritual common grounds, their mutual and constructive relationships, past, present and potentially future, a better understanding of the causes of their conflicts, and the current challenges of their encounter with atheism, agnosticism and secular societies.

In addition, Religions/Adyān wishes to highlight and revive the universal horizon of Islam by fostering studies in the relationships between Islam and other religions and civilizations in history, the arts, and religious studies. This is also a way to revitalize intellectual discourse in Islam, within the context of an interactive and cross-fertilizing engagement with other faiths.

The essays published in Religions/Adyān exclusively engage the intellectual responsibility of their authors, and do not necessarily reflect the views of the DICID. They are published as part of an ongoing dialogue on religions, and should not be construed as the expression of the positions of any sponsoring organization.

CONTENTS

Editorial: Patrick Laude	3
Interview with Ravi Ravindra	5
Beyond the Science Delusion: Rupert Sheldrake	12
Buddhism and Science in the Mirror of Language: Francisca Cho	20
Changing Limits of Life, Death and the Body: Nazife Şişman	29
Stem Cell Research and Judaism: Jonathan K. Crane	41
Erasmus Darwin's Impact on English Romanticism: Alan Weber	55
Science and the Heart of Religion: Philip Clayton	66
Illumination without Knowledge: Philip Sheldrake	75
Tarkovsky, Science and Faith: Elizabeth Zelensky	84
Theological Response for Ray Kurzweil's Future Perfect: Ashley Moyse	93
Qu'ranic Foundation of Islamic Science: Senad Mrahorović	103
Book Review: Leo Lefebure	112



Medieval Astrolabe: Museum of Islamic Art Collection (Qatar)

EDITORIAL

The intersection of science, knowledge and religion has been one of the most important and sensitive areas in the last centuries, particularly in the West, as these domains have increasingly drifted apart from each other. The bifurcation between knowledge and faith has been a result of a profound alteration of both. Since the scientific revolution of the seventeenth century in Europe, knowledge has been almost exclusively reduced to an acquisition of information about nature, mankind and the myriad of phenomena that are apprehensible by human consciousness, while faith has all too often been confused, especially in the last centuries, with a mere belief grounded in customs and sentiments. The result is that for many today, science has become a religion, that is a belief system based on assumptions and premises about the nature of knowledge and the world, rather than simply an activity of inquiry into the nature and structure of the universe. Religion, conversely, has largely ceased to be a science, in the full sense of a means of knowing the Ultimate, and through it the world and the self. Indeed it has become increasingly reduced to matters of private feelings, codes of morality, or prescriptive and proscriptive rules, when it has not been turned into an ideology competing with other ideologies.

The contemporary relationship between religion and science can be schematically taken to come in one or several of the following forms. First, there is an antagonism fueled by a sense that either side of the polarity might be threatened by the other on competing grounds. Second, there is a growing interpretation of religion and science as converging in terms of understanding the world, or at least

in terms of a complementarity between the two that enriches our human outlook. Depending on the point of view this may amount to a kind of validation of religion by science, or conversely a prefiguration of science by religion. This type of understanding may even sometimes take the form of a complementary vision of science as fulfilling the needs of human rationality, and religion as fulfilling those of morality and imagination, the two coming together in full circle. Thirdly, there is a rarer, more subtle and no doubt more fruitful, view that suggests that religion and science speak mostly about different things, and not only about the same things in different ways. This means that neither antagonism nor convergence, nor even symmetrical complementarity, can account for a fully satisfactory understanding of their relationship.

The conflict between religion and science is not, therefore, inexorable, nor is the convergence of the two likely. In reality, religion has come to be identified with belief alone, and science has been by now exclusively equated with a certain form of quantifiable knowledge of the world; but this has not always nor everywhere been the case. For instance, many Muslims today look with nostalgia at a past in which scientific knowledge was paramount in their civilization, and wonder how to restore this glory. One unconvincing way to do so is to embrace the modern concept of science and to rename it Islamic, with a few ethical caveats attached; not to mention popular attempts at treating the *Qur'ān* as a scientific or technological handbook with the advent of a kind of "Islamic scientism".

This amounts to ignoring, among other things, that the Quranic term used to refer to "science", *'ilm*, encompasses a range of meanings that is much broader than is ordinarily realized by believers today. The word science appears in the *Qur'ān* in contexts and with meanings that challenge facile and flattening down contemporary translations and applications. Islam tended to define science as the "firm certitude in agreement with reality" (*al-isti'qād al-jāzim al-mutābiq li-l-wāqī'*) to quote only one standard definition, by Jurjānī (1339-1413) in his *Kitāb at-ta'rīfāt*. And the *Qur'ān* contains numerous mentions of "science" that can hardly be limited to what most contemporaries understand by this term, i.e. a verifiable, quantifiable, increase of information about the material universe that surrounds us. For instance, it is very unlikely that the science/*'ilm* received by the mysterious guide of Moses in the Surah of the Cave (*wa 'alamnāhu min ladunnā 'ilman*, "and we taught him a science from Us", 18:65) could be equated with the science of contemporary biologists or physicists.

There is no question that science and knowledge encompass an extremely wide range of objects. The breadth of knowledge has been in a sense widened by the modern epistemological revolution of the seventeenth and eighteenth centuries by opening onto domains of reality, primarily on the physical plane, that had been relatively unexplored by pre-modern mankind. However, the question remains of knowing whether, for most, this analytic and quantitative progress has not been paid at the price of an atrophy of metaphysical intuition and the sense of the sacred.

Patrick Laude
Editor-in-Chief



Buddhist monk meditating: Traditional Chinese painting

Interview

with Ravi Ravindra

Can science help us know the nature of God through his creation?

So much depends on what one thinks or imagines 'God' is. If there is some sort of a *personal* God nothing in science can show us the face of such an anthropomorphic Being. Those scientists who are not completely driven away by

the very word 'God' are much more likely to be sympathetic to the God of Spinoza or Einstein in which, in the words of Einstein, there is a cosmic "intelligence of such superiority that, compared with it, all the systematic thinking and acting of human beings is an utterly insignificant reflection." (*Ideas and Opinions*, 11)

What science can do and is doing quite well, is to reveal such amazing Intelligence pervading the cosmos. But when it comes to 'personal God,' this is what Einstein said, "In the struggle for ethical good teachers of religion must have the stature to give up the doctrine of a personal God, that is give up the source of fear and hope which in the past placed such vast powers in the hands of priests." (*Out of My Later Years*, 28 -9)

It is useful to remember that all the major theologians even in the Biblical traditions, where the idea of a personal God is so predominant, would be aghast at imposing human characteristics on God. In other traditions, especially in Buddhism and in Vedanta, the Ultimate Reality transcends any notion of God in the Biblical traditions. These trans-theistic perspectives are sometimes erroneously regarded as atheistic.

What does process theology tell us about the nature of God?

Different process theologians have understandably different

emphasis. As a general comment, the God of process theology rejects the omniscient God knowing and determining all future becomings. This release of the process of becoming is much more congenial to scientific activity dealing with events and the process of change in time.

How can religion help us solve scientific problems that humanity faces today like global warming?

There is no monolithic meaning of 'religion' any more than that of 'God.' For a great many people, religion amounts to a set of beliefs in some ancient scripture and codified by some councils many centuries ago. Mostly what goes on in the name of religion is close-mindedness; unfortunately far too often resulting in fanaticism and bigotry. However, for some people a religious mind is a learning mind, willing to be surprised, and open to all reality. For such people, concern for and care of all of nature, including the planet Earth, is a part of being more and more fully human. For them

any problems facing our planet or humanity in general need our attention, resources and energy. Depending on their sphere of activity, such religious people will make their contributions as voters, tax payers or as scientists in solving the relevant problems.

Can nature and beauty help bring together scientists and theologians?

Both nature and beauty help human beings towards a clearer mind and a larger heart whether they are theologians or scientists or anybody else. Then it will be easier for them to feel that there cannot in principle be any contradiction between scientific research and spiritual search. However, if the scientists in question are addicted to scientism and regard the universe wholly in materialist terms, or the theologians in question are dedicated to the defense of some dogma, it is unlikely that anything—including nature and beauty—will bring them together.

Can science explain religion?

I have an impression that much of what goes on in the name of religion, and the consequent psychological attitudes and behaviour, can be fairly well explained by increasingly subtler scientific investigations in the fields of psychology and psychiatry, largely because much of this so called religious behaviour is driven by ordinary fears of the unknown and desires for comfort and security. However, the religion pertaining to the spiritual realities experienced by the great sages and mystics in all traditions—such as the Buddha, the Christ, John of the Cross, Rumi or Ramana—is beyond all categories of interest available to science.

Is science capable of proving the reality of the transcendent dimension of life?

No, simply because the transcendent dimension transcends the very categories and aspects—such as space-time, matter-energy, causality and the like—in which scientific

research operates. One can come to the Sacred only at the end of knowledge—*vedanta*. Knowledge is always not only in time and space, it is of time and space. The Sacred manifests in great vision which cannot be formulated or codified.

Would science better serve the spiritual potential of the human race by acknowledging the inherent limits of its domain?

Most if not all of the first class scientists—Einstein, Newton, Swedenborg, Darwin, Neils Bohr, Schroedinger, to name only a few—acknowledge the inherent limits of science. Here are some comments of Schroedinger, the father of Wave Mechanics: “Physics has nothing to do with religion. Physics takes its start from everyday experience, which it continues by more subtle means. It remains akin to it, does not transcend it generically, it cannot enter into another realm” (*Science, Theory and Man*, 307 -8). He characterizes such attempts as “sinister.” “The territory

from which previous scientific attainment is invited to retire is with admirable dexterity claimed as a playground of some religious ideology that cannot really use it profitably, because its [religion’s] true domain is far beyond anything in reach of scientific explanation” (*Nature and the Greeks*, 8).

How does your interest in the various religious traditions of the world inform your practice of science?

What interests me in the various religious traditions are the various spiritual practices and disciplines and not so much their dogmas or belief systems. Even a slight awareness of any of these disciplines, and certainly a serious engagement with any one of them makes one aware of the fact that all spiritual traditions speak of various levels of reality both inside us as well as outside. Just as a human being has physical, emotional, mental and spiritual aspects so does the cosmos. Also, that there is a correspondence between internal and external

levels. In the words of St. Paul, the eyes of the flesh can see the things of the flesh and the eyes of the spirit the things of the spirit.

Therefore, the purpose of the spiritual disciplines is to cleanse our perceptions qualitatively so that we can begin to see, feel and sense the spiritual dimensions of whatever we look at—nature, other people, other cultures and the whole universe. The more one is spiritually oriented, the more one can engage in scientific research out of wonder and joy, not necessarily out of competition.

Has being a scientist affected your spiritual evolution?

The entire enterprise of spiritual disciplines is oriented towards the enhancement of the quality of the person, ultimately resulting in a complete freedom from me-me. If one is not moving towards more compassion and love, a clearer understanding of one's place in the cosmos which naturally frees one from more pride and arrogance, one is not spiritual. Scientific research, on the other

hand, is not especially interested in the quality of the persons practicing science. However, any serious spiritual undertaking is suffused with a scientific temper so that one relies on a clear mind and direct perceptions, not on somebody else's authority.

What is it that really motivates science? And how is that different from what motivates spiritual pursuit?

Other than survival, food and the like, there are two great human needs, needs of the soul: knowledge and meaning. Science is the quest for knowledge. The search for meaning in one's life immediately brings one towards relationship—with oneself, with the other humans and with the Ultimate Reality. That is why in spiritual literature one can hardly escape the great emphasis on love, compassion, freedom from selfishness and the like—all the necessary requirements for any meaningful relationship.

Scientific research and spiritual search both proceed from a sense

of Mystery—mystery inside and mystery outside, both aspects of the Great Mystery. Scientific research has to do with trying to know the unknown, but this unknown is in principle knowable. Spiritual search, or search for the Sacred, has to do with the cultivation of a relationship with the Unknowable Mystery. Spiritual mysteries—such as God is love (1 John 4.16), or Atman is Brahman (Mandukya Upanishad 2)—cannot be solved in the sense that the solution can be articulated in rational terms and passed on to someone else. However, in a contemplative state of a quiet mind these mysteries can be dissolved. Then one no longer denies the Mystery or fears it; one celebrates the mystery. A dancer celebrates the Mystery in dance, a musician in music; and a physicist by engaging in doing physics.

Although it is not generally the case, science itself can be, and has been for some scientists, a spiritual path gradually freeing them from the ego. As Einstein said, echoing the insight of all the great spiritual sages of the world: “The true value of a human being is determined

primarily by the measure and the sense in which he has attained liberation from the self.” (*Ideas and Opinions*, 12).

How can the internal process of religious and scientific thought be reconciled?

It should be clear from the answers to the previous questions, that according to my understanding there cannot in principle be any conflict between scientific research and spiritual search. No true scientist can be untouched by the grandeur of the vastness of the cosmos and the harmony of the intricate natural laws. If such feelings are not suppressed by some cultural conditioning, the resulting rapturous amazement is bound to lead one to an ardent reflection on one’s place in this immensity. These feeling experiences are the intimations of the Sacred.

Similarly, anyone touched by the spiritual Truth is naturally interested in the incredible order displayed by the manifested universe. In principle, even at

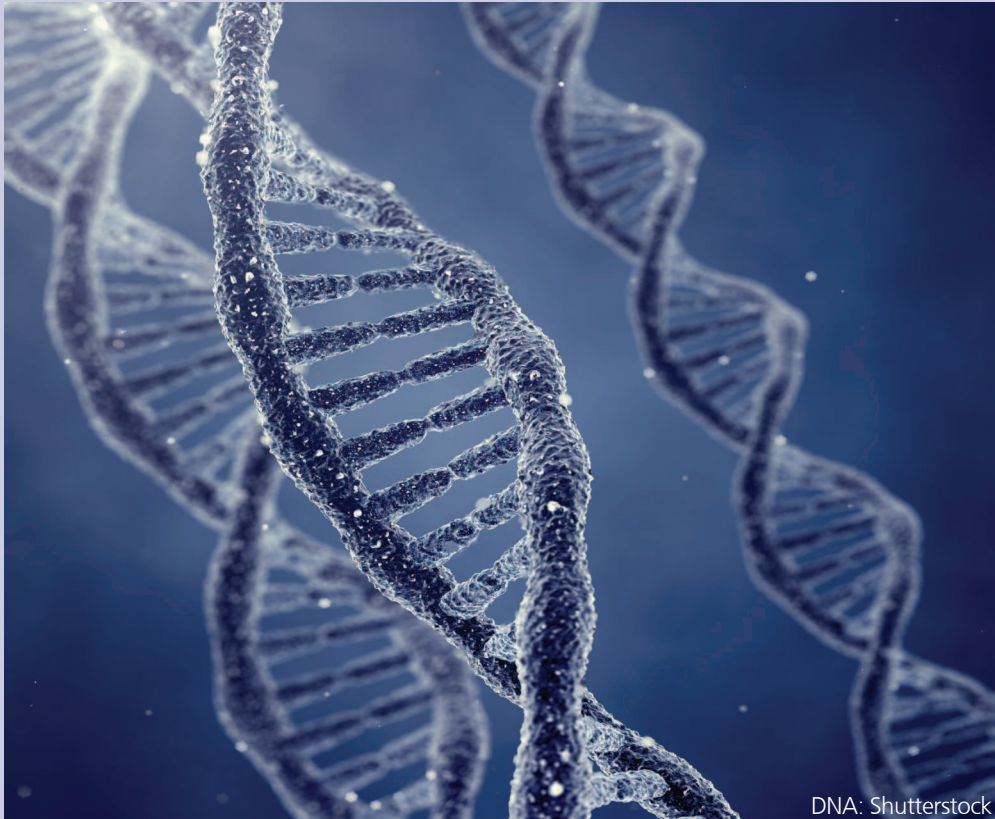
the most ordinary level, every human being is both potentially a scientist—interested in the external cosmos as it presents itself to our senses and mind—and a spiritual searcher—interested in the meaning of one’s life and one’s true place in the vastness.

What is your view of the future perspectives on the intersection of science and religion, especially as scientific discoveries and advances continue?

Treating science and religion as abstractions and trying to oppose them or to reconcile them is a wrong-headed approach. Each human being wishes to be whole—uniquely oneself but participating in the oneness of all there is. These abstractions interfere with the search for wholeness. At the end of learning, a serious person returns to himself. Then one sees that not only I know very little, but that the whole of humanity knows very little. This sense of not knowing is not a celebration of ignorance, but a quality of innocence in the presence of the Vastness. One can

be open to the Great Mystery. The more science reveals the workings of great nature, the deeper the Mystery becomes.

Two forms of awareness can reside in the same person: on the one hand, direct subtle supersensuous perceptions and, on the other, reasoned scientific theorizing and experimentation with its corresponding philosophical abstractions—however rare actual instances of this may be. The reconciliation of religion and science needs to take place in the soul of the same whole person so that there can be purposive action without self-centeredness, individuality without egoism, wholeness without loss of uniqueness. For many great scientists, the Sacred was not discovered or proved by science. The Sacred called them, pervaded their lives, and gave significance to their scientific activity, as it would have to their other activities, such as music or poetry or painting, if they had been called to celebrate the Sacred through the arts, as were Bach, Kalidasa, and El Greco.



DNA: Shutterstock

Beyond the Science Delusion

by Rupert Sheldrake

The “scientific worldview” is immensely influential because the sciences have been so successful. No one can fail to be awed by their achievements, which touch all our lives through technologies and through modern medicine. Our intellectual world has been transformed through an immense expansion of our knowledge, down into the most microscopic particles of matter and out into the vastness of space, with hundreds of billions of galaxies in an ever-expanding universe.

Yet in the second decade of the twenty-first century, when science and technology seem to be at the peak of their power, when their influence has spread all over the world and when their triumph seems indisputable, unexpected problems are disrupting the sciences from within. Most scientists take it for granted that these problems will eventually be solved by more research along established lines, but some, including myself, think that they are symptoms of a deeper malaise. Sci-

ence is being held back by centuries-old assumptions that have hardened into dogmas. The sciences would be better off without them: freer, more interesting, and more fun.

The biggest scientific delusion of all is that science already knows the answers. The details still need working out, but the fundamental questions are settled, in principle. Contemporary science is based on the claim that all reality is material or physical. There is no reality but material reality. Consciousness is a by-product of the physical activity of the brain. Matter is unconscious. Evolution is purposeless. God exists only as an idea in human minds, and hence in human heads.

These beliefs are powerful not because most scientists think about them critically, but because they don't. The *facts* of science are real enough, and so are the techniques that scientists use, and so are the technologies based on them. But the belief system that governs conventional scientific thinking is an act of faith, grounded in a nineteenth century ideology.

The scientific creed

Here are the ten core beliefs that most scientists take for granted:

1. Everything is essentially mechanical. Dogs, for example, are complex mechanisms, rather than living organisms with goals of their own. Even people are machines, “lum-

bering robots”, in Richard Dawkins' vivid phrase, with brains that are like genetically programmed computers.

2. All matter is unconscious. It has no inner life or subjectivity or point of view. Even human consciousness is an illusion produced by the material activities of brains.

3. The total amount of matter and energy is always the same (with the exception of the Big Bang, when all the matter and energy of the universe suddenly appeared).

4. The laws of nature are fixed. They are the same today as they were at the beginning, and they will stay the same forever.

5. Nature is purposeless, and evolution has no goal or direction.

6. All biological inheritance is material, carried in the genetic material, DNA, and in other material structures.

7. Minds are inside heads and are nothing but the activities of brains. When you look at a tree, the image of the tree you are seeing is not “out there”, where it seems to be, but inside your brain.

8. Memories are stored as material traces in brains and are wiped out at death.

9. Unexplained phenomena like telepathy are illusory.

10. Mechanistic medicine is the only kind that really works.

Together, these beliefs make up the

philosophy or ideology of materialism, whose central assumption is that everything is essentially material or physical, even minds. This belief-system became dominant within science in the late nineteenth century, and is now taken for granted. Many scientists are unaware that materialism is an assumption; they simply think of it as science, or the scientific view of reality, or the scientific worldview. They are not actually taught about it, or given a chance to discuss it. They absorb it by a kind of intellectual osmosis.

In everyday usage, materialism refers to a way of life devoted entirely to material interests, a preoccupation with wealth, possessions and luxury. These attitudes are no doubt encouraged by the materialist philosophy, which denies the existence of any spiritual realities or non-material goals, but in this article I am concerned with materialism's scientific claims, rather than its effects on lifestyles. In the spirit of radical scepticism, each of these ten doctrines can be turned into a question, as I show in my book *The Science Delusion*¹ (called *Science Set Free* in the US). Entirely new vistas open up when a widely accepted assumption is taken as the beginning of an enquiry, rather than as an unquestionable truth. For example, the assumption that nature is machine-like or mechanical becomes a question: "Is nature

mechanical?" The assumption that matter is unconscious becomes "Is matter unconscious?" And so on.

The credibility crunch for the "scientific worldview"

For more than 200 years, materialists have promised that science will eventually explain everything in terms of physics and chemistry. Science will prove that living organisms are complex machines, minds are nothing but brain activity and nature is purposeless. Believers are sustained by the faith that scientific discoveries will justify their beliefs. The philosopher of science Karl Popper called this stance "promissory materialism" because it depends on issuing promissory notes for discoveries not yet made.² Despite all the achievements of science and technology, materialism is now facing a credibility crunch that was unimaginable in the twentieth century.

In 1963, when I was studying biochemistry at Cambridge University, I was invited to a series of private meetings with Francis Crick and Sydney Brenner in Brenner's rooms in King's College, along with a few of my classmates. Crick and Brenner had recently helped to "crack" the genetic code. Both were ardent materialists and Crick was also a militant atheist. They explained there were two major unsolved problems in biology: development and consciousness. They had not been

solved because the people who worked on them were not molecular biologists—nor very bright. Crick and Brenner were going to find the answers within 10 years, or maybe 20. Brenner would take developmental biology, and Crick consciousness. They invited us to join them.

Both tried their best. Brenner was awarded the Nobel Prize in 2002 for his work on the development of a tiny worm, *Caenorhabdylis elegans*. Crick corrected the manuscript of his final paper on the brain the day before he died in 2004. At his funeral, his son Michael said that what made him tick was not the desire to be famous, wealthy or popular, but “to knock the final nail into the coffin of vitalism.” (Vitalism is the theory that living organisms are truly alive, and not explicable in terms of physics and chemistry alone.)

Crick and Brenner failed. The problems of development and consciousness remain unsolved. Many details have been discovered, dozens of genomes have been sequenced, and brain scans are ever more precise. But there is still no proof that life and minds can be explained by physics and chemistry alone (Chapters 2, 5 and 9).

The fundamental proposition of materialism is that matter is the only reality. Therefore consciousness is nothing but brain activity. It is either like a shadow, an “epiphenomenon”, that does nothing,

or it is just another way of *talk-ing* about brain activity. However, among contemporary researchers in neuroscience and consciousness studies there is no consensus about the nature of minds. Leading journals such as *Behavioural and Brain Sciences* and the *Journal of Consciousness Studies* publish many articles that reveal deep problems with the materialist doctrine. The philosopher David Chalmers has called the very existence of subjective *experience* the “hard problem”. It is hard because it defies explanation in terms of mechanisms. Even if we understand how eyes and brains respond to red light, the experience of redness is not accounted for.

In biology and psychology the credibility rating of materialism is falling. Can physics ride to the rescue? Some materialists prefer to call themselves physicalists, to emphasize that their hopes depend on modern physics, not nineteenth-century theories of matter. But physicalism’s own credibility rating has been reduced by physics itself, for four reasons:

First, some physicists insist that quantum mechanics cannot be formulated without taking into account the minds of observers. They argue that minds cannot be reduced to physics because physics presupposes the minds of physicists.³

Second, the most ambitious unified theories of physical reality,

string and M-theories, with ten and eleven dimensions respectively, take science into completely new territory. Strangely, as Stephen Hawking tells us in his book *The Grand Design* (2010), “No one seems to know what the ‘M’ stands for, but it may be ‘master’, ‘miracle’ or ‘mystery’”. According to what Hawking calls “model-dependent realism”, different theories may have to be applied in different situations. “Each theory may have its own version of reality, but according to model-dependent realism, that is acceptable so long as the theories agree in their predictions whenever they overlap, that is, whenever they can both be applied”.⁴

String theories and M-theories are currently untestable, so “model-dependent realism” can only be judged by reference to other models, rather than by experiment. It also applies to countless other universes, none of which has ever been observed. As Hawking points out, M-theory has solutions that allow for *different universes* with different apparent laws, depending on how the internal space is curled. M-theory has solutions that allow for many different internal spaces, perhaps as many as 10^{500} , which means it allows for 10^{500} different universes, each with its own laws.... The original hope of physics to produce a single theory explaining the ap-

parent laws of our universe as the unique possible consequence of a few simple assumptions may have to be abandoned.⁵ Some physicists are deeply sceptical about this entire approach, as the theoretical physicist Lee Smolin shows in his book *The Trouble With Physics: The Rise of String Theory, the Fall of a Science and What Comes Next* (2008).⁶ String theories, M-theories and “model-dependent realism” are a shaky foundation for materialism or physicalism or any other belief system.

Third, since the beginning of the twenty-first century, it has become apparent that the known kinds of matter and energy make up only about four percent of the universe. The rest consists of “dark matter” and “dark energy”. The nature of 96 percent of physical reality is literally obscure.

Fourth, the Cosmological Anthropic Principle asserts that if the laws and constants of nature had been slightly different at the moment of the Big Bang, biological life could never have emerged, and hence we would not be here to think about it. So did a divine mind fine-tune the laws and constants in the beginning? To avoid a creator God emerging in a new guise, most leading cosmologists prefer to believe that our universe is one of a vast, and perhaps infinite, number of parallel universes,

all with different laws and constants, as M-theory also suggests. We just happen to exist in the one that has the right conditions for us.⁷

This multiverse theory is the ultimate violation of Ockham's Razor, the philosophical principle that "entities must not be multiplied beyond necessity", or in other words that we should make as few assumptions as possible. It also has the major disadvantage of being untestable.⁸ And it does not even succeed in getting rid of God. An infinite God could be the God of an infinite number of universes.⁹

Materialism provided a seemingly simple, straightforward worldview in the late nineteenth century, but twenty-first century science has left it far behind. Its promises have not been fulfilled, and its promissory notes have been devalued by hyperinflation.

I am convinced that the sciences are being held back by assumptions that have hardened into dogmas, maintained by powerful taboos. These beliefs protect the citadel of established science, but act as barriers against open-minded thinking. They prevent serious dialogues with other cultures and religious traditions, which are dismissed as "unscientific" or "superstitious".

New dialogues with religions

As the sciences free themselves from the constrictions of materialism,

many new possibilities arise. And many of them raise new possibilities for dialogues with religious traditions.¹⁰ Here are a few examples.

Statistical research has shown that people who attend religious services regularly tend to live longer, have better health and are less prone to depression than those who do not. Also, the practices of prayer and meditation often have beneficial effects on health and longevity.¹¹ How do these practices work? Are the effects purely psychological or sociological? Or does the connection with a larger spiritual reality confer a greater capacity to heal and an enhancement of wellbeing?

If organisms at all levels of complexity are in some sense alive with their own purposes, this implies that the earth, the solar system, our galaxy, and indeed all the stars, have lives and purposes of their own. And so may the entire universe.¹² The cosmic evolutionary process may have inherent purposes or ends, and the cosmos may have a mind or consciousness. Since the universe itself is evolving and developing, the mind or consciousness of the universe must be evolving and developing too. Is this cosmic mind the same as God? Perhaps only if God is conceived of in a pantheistic spirit as the soul or mind of the universe, or of nature. In the Christian tradition, the world soul is not identical with God, whose being transcends

the universe. For example, the early Christian theologian Origen (c.184-253) thought of the world soul as the Logos, endlessly creative, which gave rise to the world and the processes of development within it. The Logos was an aspect of God, not the whole of God, whose being transcended the universe.¹³ If instead of one universe there are many, then the divine being would include and transcend them all.

The universe is evolving and is the arena of continuing creativity. Creativity is not confined to the origin of the universe, as in Deism, but is an ongoing part of the evolutionary process, expressed in all realms of nature, including human societies, cultures and minds. Although the creativity expressed in all these realms may have an ultimately divine source, there is no need to think of God as an external designing mind. In the Judeo-Christian tradition, God imbued the natural world with creativity too, as in the first chapter in the book of Genesis, where he called forth life from the earth and the seas (Genesis, 1: 11,20,24) - a very different image from the engineering God of a mechanistic universe. And in a creative, evolving universe there is no reason why the appearance of matter and energy should be confined to the very first instant, as in the standard Big Bang theory. Indeed, some cosmologists propose that the continued expan-

sion of the universe is driven by the ongoing creation of "dark energy" from the universal gravitational field or from the "quintessence field".¹⁴

If the laws of nature are more like habits, and there is an inherent memory within the natural world,¹⁵ how does this relate to the principle of karma in Hinduism and Buddhism, a chain of cause and effect that implies a kind of memory in nature? In some schools of thought, as in the *Lankavatra Sutra* of Mahayana Buddhism, there is a cosmic or universal memory.¹⁶

If minds are not stored as material traces in brains, but depend on a process of resonance, then memories themselves may not be extinguished at death, although the body through which they are normally retrieved decays.¹⁷ Is there some other way in which these memories can continue to act? Can some non-bodily form of consciousness survive the death of the body and still gain access to an individual's memories, conscious or unconscious, as all religions suppose?

If minds are not confined to brains, how do these human minds relate to the minds of higher-level systems of organization, like the solar system, the galaxy, the universe and the mind of God? Are mystical experiences just what they seem to be: connections between human minds and larger, more inclusive forms of consciousness?

If human minds, individually and collectively, make contact with minds of higher-level minds, including the ultimate consciousness of God, to what extent can they influence the evolutionary process, or be influenced by the divine will? In an evolutionary, living universe, are humans merely part of an unfolding process on one isolated planet, or does human consciousness play a larger role in cosmic evolution, in some way connected to minds in other parts of the universe?

All religious traditions grew up in a pre-scientific era. The sciences have revealed far more of the natural world than anyone could have

imagined in the past. For example, only in the nineteenth century were the great sweep of biological evolution and the aeons of geological times recognized, and only in the twentieth century were galaxies outside our own discovered, along with the vast expanse of time from the Big Bang to the present. The sciences evolve, and so do religions. No religion is the same today as it was at the time of its founder. Instead of the bitter conflicts and mutual distrust caused by the materialist worldview, we are entering an era in which sciences and religions may enrich each other through shared explorations.

Notes

¹ Sheldrake, R., 2012, *The Science Delusion: Freeing the Spirit of Enquiry*, London: Coronet.

² In Popper, K. R., and Eccles, J. C., 1977, *The Self and Its Brain*, Berlin: Springer International.

³ E.g. D'Espagnat, B., 1976, *Conceptual Foundations of Quantum Mechanics*, Reading, MA: Benjamin.

⁴ Hawking, S., and Mlodinow, L., 2010, *The Grand Design: New Answers to the Ultimate Questions of Life*, London: Bantam Press, p. 117.

⁵ *Ibid.*, pp. 118-119.

⁶ Smolin, L., 2006, *The Trouble With Physics: The Rise of String Theory, The Fall of a Science, and What Comes Next*, London: Allen Lane.

⁷ Carr, B. (ed.), 2007, *Universe or Multiverse?*, Cambridge: Cambridge University Press; Greene, B., 2011, *The Hidden Reality: Parallel Universes and the Deep Laws of the Cosmos*, London: Allen Lane.

⁸ Ellis, G., 2011, 'The untestable multiverse', *Nature*, 469, pp. 295-295.

⁹ Collins, in Carr (ed.), 2007, *op. cit.* pp. 459-480.

¹⁰ See for example my own explorations with the theologian Matthew Fox in Sheldrake, R. and Fox, M., 1996, *Natural Grace: Dialogues on Science and Spirituality*, London: Bloomsbury, and Fox, M. and Sheldrake, R., 1996, *The Physics of Angels: Exploring the Realm Where Science and Spirit Meet*, San Francisco, Harper.

¹¹ Discussed in Sheldrake, 2012, *op. cit.*, Chapter 10.

¹² *Ibid.*, Chapter 1.

¹³ Tarnas, 1991, Chapter 3.

¹⁴ Sheldrake, 2012, Chapter 2.

¹⁵ *Ibid.*, Chapter 3.

¹⁶ Suzuki, D.T., 1998, *Studies in the Lakavatara Sutra*, New Delhi: Munshiram Manoharlal Publishers.

¹⁷ Sheldrake, 2012, *op. cit.*, Chapter 7.



Virgo Star sign: Indian Temple illustration

Buddhism and Science in the Mirror of Language

by Francisca Cho

Introduction

From the very beginning of the European encounter with Buddhism, both Asian and western commentators have argued that Buddhism is compatible with science.¹ It is no coincidence that this occurred in the nineteenth century, when the tensions between Christianity and science began to surface as a consequence of the Darwinian theory of evolution. The evolutionary story about the creation of life from purely natural forces and the descent of human beings from primate ancestors pose direct challenges to Biblical narratives about creation. In contrast, Buddhism does not posit a creator God, and is not

particularly challenged by solely naturalistic explanations of the universe. Here is a religion, it was consequently proclaimed, which dispenses with mythological dogmas and approaches the world with scientific rationality. The entry of Buddhism into the West, then, was facilitated by the homegrown tensions between religion and science in Europe and North America.

The current Dalai Lama of Tibet, Tenzin Gyatso, has been the most energetic and influential force on the ground since the 1980s, with published accounts of his meetings with high profile scientists and his own book on the subject of Buddhism and

science.² By reframing Buddhist thought to address contemporary western concerns, the Dalai Lama counsels that embracing science does not have to bottom out into a physicalist view of the universe that is inherently anti-religious. Although the Buddhist approach to personhood does not posit a creator God or an eternal soul, it can still affirm non-reductive scientific understandings of mind and human life. This interface between Buddhism and science emphasizes issues that are not traditionally important in Buddhism, but such responsiveness to western concerns is seen as a bridge to conversation. As David McMahan states: "It could position Buddhism to bring novel conceptual resources to the West and the modern world that might indeed offer new perspectives on some of modernity's personal, social, political, and environmental ills."³

Nevertheless, scientific rationality forms the standard of correct knowledge in the dialogue between Buddhism and science. But Buddhist traditions are twenty-five centuries old, extremely diverse, and combine apparently "scientific" parts with others that are rather difficult to parse scientifically—such as the doctrine of karma and rebirth. In the interface between Buddhism and science, the validity of Buddhist

claims "is now being subsumed beneath the epistemic authority of the scientist",⁴ who might very well decide that in some respects, the Buddha got things wrong. Being right or wrong, however, is contingent upon foundational epistemological assumptions regarding the nature of knowledge. This includes views about the role of our utterances—our language and propositions—in making claims about the world. So the question of who is right and who is wrong is determined by whose theoretical assumptions prevail in the dialogue. It is clear that for the time being, the epistemological assumptions of western science and philosophy dominate the conversation.

The philosopher Owen Flanagan states, "Members of my tribe are fans of science. The scientific method has shown, and keeps showing, its mettle when it comes to revealing the truth in a way no other method matches." So if there is to be room for Buddhism, he continues, "it will need to be a tame kind of Buddhism, which is, at a minimum, consistent with science — 'Buddhism naturalized.'"⁵ Naturalism comes in many varieties, Flanagan explains, but the "entry-level union card" requires just saying "no" to the supernatural: "Rebirth, heavens, hells, creator gods, teams of

gods, village demons, miracles, divine retribution . . . are things naturalists don't believe in."⁶ Now Buddhism, Flanagan concedes, is philosophically deep. But it needs to eject the "mind-numbing and wishful hocus-pocus that infects much [of] Buddhism" if it wants to be taken seriously. This must begin with the concession that "What there is, and all there is, is natural stuff, and everything that happened has some set of natural causes that produce it—although we may not be able to figure out what these causes are or were."⁷

But if the dialogue between Buddhism and science is to be substantial, then it is critical to understand Buddhism better than many presently do. Better understanding means assessing the conflict between religion and science from a Buddhist perspective, rather than reducing Buddhism to the mere object of scientific validation or refutation. Buddhist assumptions are different from western ones and its major teachings—such as karma—are best not shoehorned into foreign philosophical frameworks like Cartesian mind/body dualism. We must instead understand karma relative to its own epistemological framework. When this kind of work is done, the Buddhist worldview can usefully illuminate the philosophical assumptions

that create tensions between Christianity and science that are otherwise difficult to see. This helps to see our own dilemmas in a new and perhaps useful light.

In this paper, I focus on one salient example. The arc of Buddhist tradition probes and questions the belief that human language is able to articulate timeless and universal truths. If this skepticism about the capacity of language is justified, then it has direct significance for the modern western tension between religion and science because this conflict centers on whose propositions and narratives about the universe are correct. If we take Buddhism seriously, one must consider the possibility that neither religious nor scientific discourse can claim definitive knowledge, and that even a combination of the two is not adequate.⁸ Owen Flanagan notes that "Many scientists will claim to be in search of *the* truth—regardless of consequences".⁹ For this reason many will reject this Buddhist contribution and the courtship will be over. But it is possible that others in the science tribe will actually find the Buddhist version of things more persuasive—even more "scientific"—than the vision of science that currently dominates.

The Buddhist View of Language

I will summarize three basic views about the nature and function of language that are expressed throughout the history of Buddhist thought. Although these views are pervasive in Buddhism, I draw particularly from discussions about scriptural authority in Indian Mahayana and Chinese Zen Buddhism. Although Buddhists revere their scriptures as much as any other religious group, their learned discussions about the nature and function of scriptures do not accord them (nor the scriptures of any other group) the status of revelation and divine writ. Instead, they are seen as expedient human devices that should be utilized for the benefits they confer. These benefits are destroyed when texts are treated as holy and necessary in themselves. Hence the famous analogy of the raft, in which the Buddha's teachings are "for the purpose of crossing over, not for the purpose of grasping," and the analogy of the snake, in which mishandling the teachings cause them to turn around and bite the handler.¹⁰ I can only describe the views here as opposed to actually argue for them. It must suffice for the moment to say that Buddhist language skepticism is intimately tied to central Buddhist teachings about the impermanence and

mutability of all phenomenal reality, and the central role of human consciousness in organizing and making sense of this reality.

The first view is an insight into what language is and does, which turns into a warning about its limitations. Buddhist texts repeatedly teach that words and concepts are human creations rather than names that correspond to an objectively existing world "out there." We use words to pick out and separate "things" from the integrated flow of life by the power of our attention and purpose. I can scoop out a pail of water from a flowing stream and call that entity by various names that indicate my purpose for it. That "thing" can be a thirst-quenching drink, bathwater, or a home for my pet fish. But such "things" do not really exist, Buddhists repeatedly say, because we are the ones who isolate them and give them a label. Of course, words refer to *something*—If I order a taco and get escargot, I can legitimately assume the waiter misheard me or does not understand "taco" properly. Words have proper referents by virtue of social agreements that are necessary for living our daily lives. But once we have words, we succumb to the illusion that they name things that exist objectively and separately from us. Words

take on a life of their own, and so do the stories they tell. As a result, we cling to these word-worlds as objective realities, forgetting our own participation in creating them.

Buddhist tradition recognizes that language is a tool with limitations, but that, on the other hand, we can never get beyond it. Hence a second insight from Buddhism is its concept of skillful language use. It is perhaps an irony that being wary of language does not mean that Buddhists have, by any means, preferred silence over speech. The corpus of Buddhist sacred literature is huge, encompassing canons in multiple languages. To begin, there are the Pali and Sanskrit collections originating in India. This is augmented by the Chinese corpus, which includes Zen texts. Tibetan Buddhism, with its scholastic leanings, has contributed a vast world of sacred literature. If there is irony here, however, it bears an essential lesson: being aware of the limitations of words liberates Buddhists to be quite unrestricted and creative in the use of words. Words have no intrinsic or direct access to what *is*, and for that very reason, one can use them in multiples ways and senses—logical, analogical, paradoxical, poetic, ironic, and even negative ways—to have powerful and transformative effects on people.

Chinese Zen masters are overt icons of skillful speech making within Buddhist tradition. The ninth century masters Huangbo Xiyun and Linji Yixuan, for example, both impart the paradoxical message, “Do not listen to my words.” Huangbo states, “I have no thing to offer. I have never had anything to offer others. It is because you allow certain people to lead you astray that you are forever seeking intuition and searching for understanding.”¹¹ In a similar vein, Linji states, “Followers of the Way, don’t be too taken up with my pronouncements either. Why? Because pronouncements are without basis or underpinning, something painted for a time on the empty sky, as in the simile of the painter with his colors”.¹² Both the records of Huangbo and Linji suggest that these masters said quite a lot in their lifetimes, much to the effect that they had nothing much to say or teach. Either Zen tradition does not get the irony, or the irony is essential to the message. If their words are taken seriously, as they are indeed meant to be, their effect is to liberate people from enslavement to words. Paradox and self-reflexivity are some features of Zen speech that convey the idea it is best not to take words too literally if we want to use them well. The reason why Buddhists

are so garrulous is that a full menu of verbal strategies is necessary to get the job done, and as each tactic becomes commonplace, it needs to be replaced or reinvented. This has led to the constant expansion of its “sacred” literature, and to a wide diversity of acceptable statements and ways of speaking. Buddhist liberation from words does not mean silence but rather its free and skillful use.

This history reveals a model of language use that can be applied to our own utterances. Specifically, it encourages us to relax our grip on our own stories about what is “true.” This means giving up the insistence that our discourses mirror intrinsic features of the world and to judge them instead by a very different standard. This brings us to the third and final perspective from Buddhism, which is to appreciate that words, stories, and doctrines are *prompts for action*. Speaking the “truth” is not a matter of making propositions that passively reflect the universe. Instead, true statements instruct and reveal to us how to act appropriately in a particular situation. Language is a form of instigation that moves us to proper (or improper) actions. This shift from passive to active models of language is critical.

Consider the statement: “The apple is in the cupboard.” We

normally understand this kind of sentence as giving us independent knowledge of our world that is either true or false. The existence or non-existence of an apple in the cupboard seems to be independent of the observer. But it is also possible to look at the statement for what it does. It can, for example, encode a simple instruction: “If you want an apple, go look in the cupboard.” The action model of language is all about the context and purpose of speech—about what it accomplishes within the situation in which it is spoken. The statement, then, is a *response* to a situation, as well as a prompt for further action. It can be a parent’s action in the wake of a child’s hunger. It is the action-context of what we say that give our utterances their power and truth.

To be sure, there is a descriptive component to the statement, “The apple is in the cupboard.” The utterance describes either a true or false situation; a factual or non-factual state of affairs. This must be admitted. But the inescapable fact is that true/false statements too are always made at a particular time, in a particular context. Therefore, the meaningfulness of factual utterances is also tied to specific situations and their particular goals. The reason why I would say something like “The apple is in the cupboard” has everything to do

with my aims and purposes at the given moment. I choose to say it—or not say it—because of how the needs of others, such as someone’s hunger, press upon me. It is simply impossible for speech to escape this action-consequence framing because human utterances cannot divest themselves of location, time, and the purposes they impart. As long as this is true, even descriptive sentences ultimately have actions as their ultimate referent, and the quality of the resulting action—that is, its fruitfulness or unfruitfulness—is the measure of the validity of the description.

A Buddhist Science

In what manner do these Buddhist observations about language address the tensions between religion and science in the contemporary West? They question the wisdom of battling over words like “matter” and “spirit,” with their accompanying argument over which is the underlying reality of the world. They remind us that rather than naming things that exist independently of us, they are concepts that enable different kinds of human activity and flourishing. We can derive the value of both words only when we remember their human origins and purposes, but when we idolize them they turn into vipers that turn around to strike us. The deadliest

strike consists of the socially destructive and irresolvable battle over which word is to prevail, which makes us forget about their actual uses and turns them into bones of contention. Rather than demanding that Buddhists rid their own vocabulary of religious “hocus pocus,” a substantial engagement between Buddhism and science needs to explore more foundational questions about the nature of human knowledge.

This kind of exploration promises to be fruitful because Buddhist views of language in fact reinforce the original principles of seventeenth century British empiricism. The technological marvels enabled by experimental science have led members of the “science tribe” to declare that science has the “truth” and that its ideas—such as “matter”—are truly existing things that exhausts all of reality. This is ironic given that the impetus for modern western empiricism was a Christian theological affirmation of the limits of human knowledge, based on Augustinian tenets about the fallen nature of humanity:

A premise of the experimental approach to natural philosophy that developed in England in the course of the seventeenth century was the idea that certainty could never be achieved in the sciences, and

that investigators of nature needed to lower their sights. For the experimental philosophers, guided by the Baconian vision of science as the gradual accumulation of 'historical' or experimental reports, science was to be a long-term and probabilistic enterprise.¹³ Empiricism appeals to sensory experience because of its ability to forge social consensus about mutually observable phenomena, in contrast to irresolvable metaphysical arguments. The Buddha's own appeal to personal and sensory experience was also in response to the serious social problem of rampant philosophical controversies during his own time. The seventeenth century European drive for verifiable knowledge came in reaction to the devastating religious wars and persecutions that followed in the wake of intractable theological differences.¹⁴ Empiricists and experimental philosophers were willing to abandon theological and even political debates in exchange for empirical certitudes. For Robert Boyle (1627-1691), whose air-pump experiments in pneumatics set the standard for

the experimental method, this meant making a careful distinction between the verifiability of empirical *observations*, on the one hand, and the uncertainty of their unseen *causes*, on the other.¹⁵ Hence a crucial aspect of empiricism is a commitment to steer clear of empirically irresolvable arguments.

Sometimes, when an argument reaches an impasse it takes the perspective of an outsider to pose other possibilities. Language skepticism is not unique to Buddhism, but Buddhism is notable for the degree to which it has maintained and developed this position. In the present context, it can remind western intellectuals of the skeptical roots of scientific empiricism itself and demonstrate what it looks like to make both empirical and ethical propositions in that context. Buddhist tradition has a long history of doing just that. Therefore, the western scientific engagement with Buddhism can either remake this Asian tradition into a lesser version of itself or use it as an opportunity to look at its own identity in a new way and envision new epistemological and social possibilities for itself.

Notes

- ¹ See David McMahan, 2004, 'Modernity and the Early Discourse of Scientific Buddhism', *Journal of the American Academy of Religion*, 72,4: pp. 897-933, and Donald Lopez, 2008, *Buddhism and Science: A Guide for the Perplexed*, Chicago: University of Chicago Press.
- ² Dalai Lama, 2005, *The Universe in a Single Atom*, New York: Morgan Road Books.
- ³ David McMahan, 2008, *The Making of Buddhist Modernism*, Oxford, New York: Oxford University Press, p.260.
- ⁴ McMahan, 'Modernity,' p. 927.
- ⁵ Owen Flanagan, *The Bodhisattva's Brain: Buddhism Naturalized*, Cambridge: MIT Press, p. 50.
- ⁶ Flanagan, *Bodhisattva's Brain*, p. 2.
- ⁷ *Ibid.*, p. 2.
- ⁸ Most Christian theologians who work on reconciling religion and science believe that both discourses are correct, rather than in contradiction, and need to be better integrated. See for example John Polkinghorne, 2011, *Science and Religion in Quest of Truth*, New Haven: Yale University Press. The Buddhist view I articulate here should be distinguished from this integrationist view.
- ⁹ Flanagan, *Bodhisattva's Brain*, p. 64.
- ¹⁰ Mijjhima Nikaya I. 134-136. Translated by Bhikkhu Nanamoli and Bhikkhu Bodhi, 2005, as *The Middle Length Discourses of the Buddha*, Wisdom Publications.
- ¹¹ John Blofeld, 1959, *The Zen Teaching of Huang Po on the Transmission of Mind*, New York: Grove Press, p. 119.
- ¹² Burton Watson, 1993, *The Zen Teachings of Master Lin-chi*, New York: Columbia University Press, p. 75.
- ¹³ Peter Harrison, 2007, *The Fall of Man and the Foundations of Science*, Cambridge: Cambridge University Press, p. 138.
- ¹⁴ See Michael Buckley, 1987, *At the Origins of Modern Atheism*, New Haven: Yale University Press, and Stephen Toulmin, 1990, *Cosmopolis: The Hidden Agenda of Modernity*, Chicago: University of Chicago Press.
- ¹⁵ Steven Shapin and Simon Schaffer, 1985, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*, Princeton: Princeton University Press, p. 51.



Early development of Leg braces

Changing Limits of Life, Death and the Body

By Nazife Şişman

Questions about life and death have always engaged the human imagination. However, the question “Can we live forever?”¹ has become prominent in the modern era with inventions in medical technology, such as the creation of artificial organs, the use of prostheses, and chemical contributions. The opportunities presented by the progress of medical technology have changed our understanding of life and death. For instance, we may speak

of the “right to die” and the “right to live”, yet to live and to die are matters of destiny rather than choice. Today, as biotechnology is straddling the borders of life and death, we have come to discuss *euthanasia* (the good in death) together with eugenics (the good in birth).

The inventions in the last half-century have become integrated into our lives at a dizzying speed. Antibiotics, psychological drugs, the genetic manipulation of plants

to prevent the formation of diseases or improve their durability, organ transplants, tissue transplants, cardiac pacemakers, orthopedic materials, genetic testing, gene therapy, and artificial organs are some of the inventions in use today. There are also expected developments for the near future: embryos with multiple genetic structures, i.e. new forms of life that will be generated by mixing together genes from humans, animals and plants; bodies that are continuously resuscitated with organs from clones; and corpses kept frozen in case a cure is later found for the cause of death.

Science, under the domination of technology and by being part of the global financial structure, makes it possible to patent DNA and cell cultures. Stem cells, tissues, viruses, vaccines, and even embryos have been commodified almost to the point of making people forget that these are actually parts of living beings. Fragmented body parts and living elements are now part of a new flow: interpersonal, geographical, and financial.² The body is becoming commercialized and is the object of technical practices at the same time. However, the commercialization and technicalization alter not only the body, but also our understanding of life and death.

From “Reproduction” to “Production”

New methods of assisted reproduction are mostly regarded as the miracle of a group of skilled doctors who grant the sterile couples the ability to have children. However, the application of assisting techniques is a process that profoundly transforms thoughts about reproduction. In fact, assisting techniques of reproduction have irrevocably altered the view of reproduction and its limits. The symbol of the most radical change brought about in the field of assisted reproduction is Louise Brown, the first child to be born by in vitro fertilization in 1978. This first test-tube baby did away, once and for all, with the conviction that reproduction is possible only through sexual intercourse. Intercourse with a member of the opposite sex was no longer necessary to have a child. This practice gave impetus to the development of what was termed by Anthony Giddens as “plastic sexuality” and “pure love”.³ In other words, this development led to the separation of marriage from love and sexuality, and most importantly, reproduction from sexuality. This would also lead to monumental changes in the definitions of family, marriage, and sexuality.

For instance, with the

introduction of new reproductive techniques, the natural link between social parenthood and biological parenthood has virtually disappeared. A routine treatment today, the practice of in vitro fertilization was initially an attempt to fix a naturally occurring defect. However, new technologies are attempting to produce what is impossible in nature: surrogacy, anonymous sperm banks, egg banks that enable post-menopausal pregnancy, the use of frozen egg cells in a time-delayed manner – for instance, grandmothers giving birth to babies fertilized with their daughters' eggs, babies produced from the frozen sperm or egg of a dead person, being able to choose the personality and sex of a child, producing multiple embryos from several different parents, or using human embryos to produce a variety of spare parts for humans.

Looking at this issue closely, it seems almost as if we speak of "production" rather than "reproduction" when we speak of the continuity of the human race. As reproduction is replaced by production, and a natural process becomes a medical procedure subject to human manipulation, it will inevitably result in social, cultural, legal, and moral problems. However, the overly individualistic approach, which is dominant today, gives too much

influence to the argument of "the absolute right to reproduction". According to this argument, decisions about reproduction are personal, and a person – especially a woman – should have the right to reproduction as she desires.

The argument depending on the right to reproduction posits that decisions about reproduction solely belong to the individual, as does the ultimate decision on whether to give birth or not. The desire to have children must naturally be met with tolerance and understanding since the desire to see one's lineage continue exists not only in women, who feel it more intensely because of their physiological and hormonal qualities, but also in men due to their innate nature. It is widely accepted that this desire stems from the human desire to achieve immortality. In addition, according to Muslim thinkers, the birth of a child is a means of contemplation as it is a manifestation of God, the Creator. Children are also means of testing the believer, just like wealth, property, and fame.

Continuation of lineage was an innate desire for the prophets as well. Both Prophet Zachariah and Abraham were tested with this love they held in their hearts, but they were still content with whatever came from God. They were convinced that being childless

was a condition also given by God, and when they were granted children for the submission they showed, they lived to see that having children was a means of testing the parents. For instance, Prophet Abraham was subjected to a grievous test in which he was commanded to sacrifice his son Ishmael because of the great love he had for him.

The expectation that a human being is capable of everything, which is enhanced by the possibilities offered by biotechnology, is becoming ever more conspicuous in terms of the desire to have children. For example, an important claim of the second wave feminist movement was that “biology is not destiny”, and feminists coined this phrase to free themselves from the obligation of giving birth. For them it was a prerequisite of women’s liberation to be free from the constraints of their biology, i.e. being able to put an end to the life of the fetus, which they considered a natural extension of their body. For this reason, abortion became the symbol for “choice” and women’s liberation.

Today, those who bore children by making use of sperm banks base their actions on the same argument. Since they also consider the fetus as an extension of their body, they maintain

that the father, the unborn child, the society, the state, and humanity have no say concerning this matter. This view must be considered comprehensively. For instance the following should be asked: Does this practice lead to a path toward a matriarchal society in which fatherhood is completely eradicated? The anonymity of a sperm bank allows for a structure that completely eradicates the institution of fatherhood, leaving only mothers and children.

On the other hand, with the introduction of surrogate motherhood, it is now possible to speak of children with multiple parents. This results in a serious confusion that jeopardizes one’s lineage (*nasab*), one of the five inviolable values every Muslim is to preserve. The disruption of lineage poses an urgent threat not only to the future of Muslims but also of humanity.

The Limits of Death

Just as the techniques of assisted reproduction have created ethical problems regarding the initiation and termination of embryonic life, new treatment methods have given rise to serious questions about when death actually takes place.

What is death? This is a metaphysical question in essence. But when it comes to the area

of biotechnology, we are actually speaking of a set of criteria that determine death, rather than engaging in a philosophical and metaphysical contemplation of life and death. Organ transplantation has added a new dimension to the question of actual death time. Since most organs and tissues to be transplanted are taken from a cadaver rather than a living person, the determination of the actual moment of death has attained a special meaning.

When Christian Barnard performed the first heart transplant in 1967, it was still impossible to define a person who delivered a heart for transplantation as brain dead, because the term “brain dead” was not in use back then. If bodies with dead brains rather than hearts that had stopped beating were needed for organ transplant surgery, then the definition of death had to be reformulated in line with this need. So bioethics experts, surgeons, legal experts, politicians and clergymen came together and created a definition of “brain death” through the Harvard Protocol, which made organ transplantation possible.

With the legal change in the definition of death, the search for immortality is becoming more common, and gaining the momentum from biotechnology. However, prolonging life or the

notion of immortality in this respect creates a class-based separation and a stratum between those with technology at their disposal and those without. Postmodern strategy is interested in “privatized immortality” as Zygmunt Bauman designates. Biological immortality, or prolongment of life, creates strata within society according to access to the available technology. In this way, the ones whose lives get to be prolonged are the ones with greater opportunities, i.e. those who are “most deserving” longer lives.⁴ In an advanced capitalist society, even immortality has been turned into a commodity, just like health and looking young.

Besides healing diseases, medical advances create a process whereby the definitions of life and death change. Developments in technology and biotechnology have caused debates about the exact time of death while trapping death within the confines of the medical framework. Probably for this reason, people now await death in hospital rooms or intensive care units rather than in bed at home. Philip Aries, describing the Western attitudes toward death, sees the practice of driving the terminally ill and elderly out of the home as a concrete sign of the rejection of death as mourning by pushing it outside the public sphere.⁵

In Muslim societies, the consequences of the full “medicalization” of death, as has taken place in Western societies, are not yet known; since there is a greater emphasis on the fact that life is transient and death is a part of the divine providence. There are a vast number of Islamic stories that form the background of the Islamic attitude concerning death, i.e. wisely accepting the inevitability of death.⁶ However, with the medical approach encroaching upon the entire human identity, man is defined solely as a somatic being made up of veins, nerves, muscles, and organs. Medical technology can replace defunct organs with functioning ones and offer an extended life through connection to a life support unit. This eventually gives rise to the idea that medical personnel or the relative unplugging the patient have replaced the divine will that gives life and takes it away.

However, life and death, just like illness and health, are not purely medical events. They are all pivotal events that determine one’s faith and attitude toward life, and thus one’s world and Hereafter at the same time. For this reason, Muslims, who are defined by the Qur’an as people asking for goodness regarding both worlds, must develop a certain consciousness and

mentality in order to make faith in the Hereafter a part of their daily life and put some limits to the medicalization of death.

Who Do Our Bodies Belong To?

Organ trafficking, surrogate motherhood, various experiments on the human body, biotechnology that allows for the patenting of DNA, and defining an organ as an independent unit of the body are developments which allow for the commodification of the body. It is not only technology and commercialization that lead to the commodification of the body. The preconception that the human body is void of any transcendent and spiritual dimension is another element that accelerates this process; actually, to be precise, it is the foundation of this process. The conceptual pairs *zoe-bios* in ancient Greece, spirit-body in Christianity and Islam, and even the physical body-human pair stem from the preconception that there is a core, an essence, a quality, aside from the animal nature, that makes a human what s/he is. Despite the differences in approach, the body – in the pre-modern era, and especially in the Abrahamic religions – is attributed a sanctity, as the locus of divine mercy and wisdom.

In the pre-modern era, the body was the inadequate and

unstable locus of the Self and was endowed with a “given” quality. Human interference in the body, as an unchangeable part of nature, was possible only in a very limited area. Whether they were accepted as the public representation of sin as in Christianity or as a means of testing, physical disabilities were considered to be given by God and a part of one’s destiny. On the other hand, a beautiful body was viewed as a blessing from God and a staircase leading to Him rather than being thought of as a quality acquired by one’s own efforts.

In ancient times, the body was the metaphor for the soul. The body, according to classical Islamic thought and Mediaeval Christian thought, was an element pointing to more “sublime” existences beyond it. However, in the last couple of centuries the developments in Western modernization under the leadership of science and technology have prepared the basis for the commodification of the human body. As a result of Descartes’ division of *Homo sapiens* into two parts as a body and a soul, an utter separation of powers came about - the dedication of the soul to the church and the body to science. Since the time of Francis Bacon, modern science has adopted the ideal of dominating nature, and it has proved itself in the field of medicine as well.

Knowledge is no longer the quest for contemplation; it has become power. That is why the science of medicine became a force through which the human body was manipulated in pursuit of medical scientific knowledge.

The treatment of epidemics, hygiene, vaccinations, quarantines, etc. caused the body to be controlled for the sake of health. This placed topics such as health and sexuality at the center of the modern state’s power apparatus. Foucault points out the manipulative technologies of the modern through the terms “bio-power” and “anatamopolitics”.⁷ The reduction in the working hours of mine workers, local governments starting to deal with garbage, the regulation of the quality of water and food, and the number of children a couple may have being determined by the state... These are all results of the establishment of a direct link between public health and the health of the state. Thus, the body is the last fortress captured by the modern interventionist government.

In the last quarter of the twentieth century, the body took on both a plastic and a bionic characteristic, as it is now possible to place many kinds of prostheses in the human body like cardiac pacemakers, artificial heart valves,

etc. The advances in medicine are not limited to these; the body has also taken on a communal form thanks to organ transplantation. As a result of the latest developments in gene technology and a number of practices such as cloning, it has become possible to speak of the body as a product of engineering. Above all, the body is now a matter of choice. It is technically possible to have a baby by identifying a select group of candidates from sperm and egg banks and renting a womb with the desired qualities. As a result, human beings have started to think that the control they have over life and death has become greater.

Transcending the “Human Being”

Today’s revolutionary developments in biotechnology have reached alarming limits according to many modern social theorists. Essentially, these developments have a multifaceted character and include religious, philosophical, economic, cultural, social and psychological concerns. For example, philosophical questions such as “What does it mean to be a human?” or “Does man have an unchanging nature?” are being posed today. There is also economic inequality and a dimension of exploitation that divides people into organ buyers

and organ sellers. In the last ten years, politicians, theologians and philosophers have been discussing developments that are both promising and frightening. Governments are trying to implement a set of rules regarding these developments and many intellectuals have become involved in these discussions.

Francis Fukuyama, who described the liberal system as “the end of history”, worries that in the absence of regulations, biotechnology will force our species into a post-human future.⁸ On the other hand, Jurgen Habermas points out that in this post-metaphysical age when religious and philosophical discourses around the “good life” are exhausted, issues about freedom will arise amongst future generations since a human being will probably be his/her own designer. He mentions that when the present generation has the power to shape future generations, this will give result to the instrumentalization and reification of man.⁹ This level of discussion calls for a strong bond between science and philosophy.

As early as the 1970s, Foucault tried, through the concept of bio-politics, to point out what is quite obvious today: “life” and the “living being” are at the heart of new political clashes

and economic strategies. He also demonstrates that “introduction of life into history” corresponds with the rise of capitalism.¹⁰ With the patenting of the human genome, the development of artificial intelligence, and the emergence of a new body parts (tissues, cells, organs) market, the new bio-power map is becoming clearer.

In the post-industrial society, individuals have gained the ability to redefine their identities and natures with the opportunities science has provided. So, is there a moral framework to delineate this freedom? This is a dead-end for the argument between those who forsake this new human to a “post-human” future and those who want to draw a moral framework for it. The term “post-human”, when considered alongside biotechnology, indicates a new situation. However, “trans-humans”, or mythological heroes demonstrating super human powers, or people bearing the qualities of creatures other than humans, can be seen in legends and fairy tales (werewolves, etc.), epics, or stories. The point that should be emphasized here is the transformation in the understanding of transcending the human and moving beyond it. All of the ancient traditions coined terms about people

transcending themselves. A kind of perfect flawless human, an archetype, has directed people’s lives both as a measuring tool and an ultimate goal. The human being is a transcendent being. The realm where he is to achieve this transcendence is his inner self, morality and spirituality.

In the legend of Gilgamesh, there is a struggle to overcome human limitations in search of the elixir of immortality. The remarkable point in this quest is that the endeavor to overcome these limitations stems from transcendental drives. In both Eastern and Asian religions such as Taoism, Confucianism, Hinduism, and Buddhism, as well as in religions of the book such as Islam, Christianity and Judaism, there is an image of a “real human”, “perfect human”, or “superior human”. The common characteristic of these images is that they represent the effort to surpass the limitations of the human body and elevate the spirit.

However, the struggle to transcend the human, as expressed in the terms “post-human” or “trans-human”, demonstrates itself in the empowerment of body and extension of its limits with medical technologies, artificial intelligence, and similar digital technologies. The roots of this approach can actually be found in Renaissance Humanism and

the Enlightenment. For example, Condorcet researched the medical methods of prolonging human life, Benjamin Franklin dreamed of suspended animation, and following Darwin it was claimed that man is not the last link in the chain of existence but just an early stage in it. In the nineteenth century, with the introduction of Darwinist theory and then evolutionary biology the difference between man and animals disappeared. In the last quarter of the twentieth century, improvements in biotechnology and genetic engineering started to blur the border between man and machine. Bionics, artificial intelligence, genetic replication, genetic interventions, etc. have almost brought humanity to an era in which the limits of man have become a topic of discussion. At this point, there are serious issues such as the body going beyond itself with no transcendent connections or reconstructing itself based on a claim to immortality.

In her essay "A Cyborg Manifesto", Donna Haraway said years ago that biomedical technology would take us beyond modernity and into the post-modern world of cyborgs and hybrids.¹¹ Today we witness her predictions in the process of being implemented. There is an atmosphere before us that

is putting an end to the body as existential data or a gift of God and opening its limits to discussion.

From the "Perfect Man" to the "Post Human"

Looking closely at Western thought, it can be seen that in the last four hundred years, humanism has been built not on the concept of the "real human" or the "perfect human", but on the concept of the "ordinary human", the supreme member of the animal kingdom. For this reason, the human of the humanism of Enlightenment is limited by this world. He is trapped both in his body and in this world. Martin Lings compares this philosophical approach, which is not interested in metaphysics or the higher realms of the universe, to trapping a human in a room with a low ceiling and then allowing him to fly. It is obviously not possible to fly in such an environment.¹² Therefore, it appears that man's ancient desire to transcend himself lost its central motive and started to be concentrated only on the body.

While discussing the changes in man's perception of his body and the resulting urban organization caused by developments in the field of medicine, Richard Sennet points out that the notion of happiness has shifted its source

from morality to health.¹³ Human happiness no longer depends on virtue, as explained in Plato's *The Republic*, or on living in perfect compliance with its creation, as Al-Farabi describes in *Madina al-Fadila*. To be happy, one needs to be healthy in contemporary over-medicalized society.

In earlier civilizations, one had to first grasp what it meant to be God before they could fully comprehend the meaning of being human. In the era of Nietzsche, renowned for his line "God is dead", the definition of what it meant to "be human" was given only through the concept of man. But still, it is difficult to include his "super human" theory in the trans-humanist philosophy, because Nietzsche's emphasis was more on self-realization rather than on technological transformation.¹⁴ However, in what may be categorized as the post-human era, "there is no difference or absolute line of demarcation between bodily existence and computer simulation." as Katherine Hayles remarks.¹⁵ *Homo sapiens* are no longer seen as the final stage of evolution but are anticipated to infinitely utilize both digital and medical technology along the evolutionary trail to perfection.

Cartesian philosophy separated mentally the human from the non-human. The conception

of the human, as expressed by the motto "I think therefore I am" (*cogito ergo sum*), became questionable in the face of genetic manipulation, cloning, artificial intelligence and other biotechnological developments because the exchange of tissues and organs between humans and animals makes it impossible to determine what the real essence of humanity is. With each passing day, technology turns more and more people into "post-human bodies", while offering a cyborg-like ontology that experiences ongoing structural decomposition and the existence of a prosthetic reality.

How do these biotechnological developments affect our understanding of humanity? Are we turning into post-human beings? Or does the problem lie in the initial depiction of man as "mind clothed in flesh"? At what point are Muslims, as believers in existence of the human soul, going to be included in this debate that is based on the Enlightenment principle that "man is a thinking animal"? These are the questions that have accompanied us to the new millennium. New developments in genetics and biotechnology stress the molecular dimension of man. But man is not only composed of molecules, just as he is not only a psychological

or sociological creature. Man is all of these at the same time and is, most importantly, a transcendental being. That is why subjects ranging from organ transplants, embryonic stem cell therapy, and genetic intervention

to neurological treatments that change the chemical structure of the brain should be discussed not only on the practical level, but also at the metaphysical, religious, moral, and especially theoretical levels.

Notes

¹ This is the name of a book by Bryan S. Turner, 2009, *Can We Live Forever? A Sociological and Moral Inquiry*, UK and USA: Anthem Press. He sociologically analyzes life-prolonging technologies. He subjects these technologies that promise immortality to a moral questioning.

² Nikolas Rose, 2007, *Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century*, Princeton and Oxford: Princeton University Press, p. 15.

³ Anthony Giddens, 1992, *The Transformation of Intimacy: Sexuality, Love and Eroticism in Modern Societies*, Stanford, CA: Stanford University Press; Turkish translation by Idris Şahin (trans.), 1994, *Mahremiyetin Dönüşümü: Modern Toplumlarda Cinsellik, Aşk ve Erotizm*, İstanbul: Ayrıntı yayınları, p. 8.

⁴ Zygmunt Bauman, 1997, *Postmodernity and Its Discontents*, New York: New York University Press; Turkish translation by İsmail Türkmen (trans.), 2000, *Postmodernlik ve Hosnutsuzlukları*, İstanbul: Ayrıntı yayınları, p. 226.

⁵ Philip Aries analyzes Western attitudes toward death throughout the last thousand years. Patricia M. Ranum (trans.), 1975, *Western Attitudes Toward Death, From the Middle Ages to the Present*, Baltimore: John Hopkins University Press.

⁶ The short didactic story that Mawlana Rumi relates in the Mathnawi occurs in the time of the Prophet Solomon. A man with a deathly pale face came running to the presence of the Noble Solomon. Hurriedly, he relates to the Prophet that Azrael, the angel of death, looked at him with great fury, and that he was frightened a lot. He asks Solomon to send him to India with the winds he rules. The Prophet Solomon does as the man requests, and sends him to a remote Indian island. Then he sees Azrael in his presence, and asks it why it had cast such a furious look at the man. Azrael answers, "O God's Prophet! I did not mean to frighten him, but I was just very surprised, since the order I received from God was to take his life in India. When I saw him here today, I looked at him in amazement, thinking that it was impossible for him to go there in one day." After explaining the situation, Azrael goes to India and takes the man's life as had been divinely decreed.

⁷ Michel Foucault, 1978, *The History of Sexuality: An Introduction*, New York: Vintage Books. Foucault analyses the construction of modernity through these terms in his other works also.

⁸ Francis Fukuyama, 2002, *Our Posthuman Future: Consequences of the Biotechnology Revolution*, New York: Farrar, Straus and Giroux.

⁹ Jürgen Habermas, 2003, *The Future of Human Nature*, Cambridge: Polity.

¹⁰ Michel Foucault, 2008, *The Birth of Biopolitics: The Lectures at College de France 1978-79*, Michel Senellart (ed.), Graham Burchell (trans.) Basingstoke [England], New York: Palgrave Macmillan.

¹¹ Donna Haraway, 1991, 'A Cyborg Manifesto: Science Technology and Socialist-Feminism in the Late Twentieth Century,' *Socialist Reviews*, 8: pp. 65–108. Included in Haraway's, 1991, *Simians, Cyborgs and Women: The Reinvention of Nature*, New York: Routledge.

¹² Martin Lings, 1980, *Antik İnançlar, Modern Hurafeler (Ancient Beliefs and Modern Superstitions)*, translated by E. Harman, U. Uyan. İstanbul: Yeryüzü Yayınları, p. 39.

¹³ Richard Sennett, 1996, *Flesh and Stone: The Body and the City in Western Civilization*, New York: W. W. Norton.

¹⁴ One can see this realization end in Friedrich Nietzsche's, 1978, *Thus Spoke Zarathustra*, Walter Kaufmann (trans.), Penguin Books.

¹⁵ N. Kathrine Hayles, 1999, *How We Became Posthuman: Virtual Bodies in Cybernetics, and Informatics*, Chicago: University of Chicago Press.



Clamping umbilical cord. Shutterstock

Stem Cell Research and Judaism: Ethical Concerns

By Jonathan Crane

Introduction

The potential of stem cell research to contribute to human understanding of human development, aging, ailment, and demise is indisputable. Specifically, stem cell research can enable scientists to investigate the processes of many debilitating and lethal diseases, including cancers and other DNA mutations. This line of research can also promote the development and testing of pharmaceutical treatment regimens without harming human beings as such. And it can lead to the creation of new cells, tissues, and even organs, for homogenous transplantation, which would require far less exhausting and

expensive immunosuppressing interventions than the more common xenotransplantation practice currently in vogue. Such scientific and medical advancements are indeed exciting and merit investment. But we should be precise. The stem cells most useful for such advancements are pluripotent stem cells. So the question at hand is where to source pluripotent stem cells.

Current research identifies three sources for pluripotent stem cells: adult cells, umbilical cells, and embryonic cells. Adult cells are somatic cells taken from a body after it has been born and they are highly specialized: there are

hundreds of different kinds of cells in the human body. With effort, adult cells can be retrograded back to a stage in which they are multipotent, that is, to a stage in which they can further specialize, albeit not to every other kind of cell in the body. Recent studies have been able to induce adult stem cells back further to a pluripotent stage.¹ While promising, many challenges—technological as well as biological—complicate this line of research and limit its viability as an inexhaustible source for pluripotent stem cells.

Blood extracted from umbilical cords shortly after birth is another promising source for pluripotent stem cells.² Gaining unfettered access to such cells may pose a difficulty, however. And the pluripotency of such cells has yet to be demonstrated. Perhaps the most promising sources of pluripotent stem cells are those derived from embryos.³ Not all stages of fetal development house pluripotent stem cells, however. In the first few days after conception, the cells are totipotent: they can become any cell necessary to enable the embryo to develop. Division of cells continues until they create a ball of perhaps 140 cells that are all totipotent. After this blastocyst stage, however, the cells become somewhat specialized. During gastrulation, the outermost

layer of cells eventually becomes the placenta and other material necessary to house the developing fetus. The inner cells—the embryoblast—are the source of pluripotent embryonic stem cells, since they eventually give rise to the multipotent cells that further specialize into the numerous structures comprising the human body. Such cells exist only early on in fetal development: they can be found only up to approximately 20 days after conception. Even with technological advancements, extracting these pluripotent embryonic stem cells destroys the integrity of the blastocyst as well as the embryoblast itself. For this reason, concerns about embryonic stem cells overlap with those regarding abortion.

This essay surveys Judaic perspectives on these promising yet imperfect ways of securing pluripotent stem cells for scientific and medicinal purposes. As one might expect, there is disagreement among modern Jewish bioethicists about which modes of securing these cells is permissible. Yet there is overwhelming consensus among them that using such cells to improve scientific knowledge and medicinal treatments is indeed permissible if not obligatory. To appreciate these dynamics, we first look at some principles Judaism holds in regard to medicine in

general. We then investigate in light of Judaic texts the particular strategies used to extract and establish pluripotent stem cells. The concluding section evaluates these principles and concerns.

Jewish Principles Regarding Medicine

First and foremost, Judaism assumes human life to be sacred in and of itself. This is due in part to the presumption that God is the ultimate owner of human bodies and humans are but tenants given the responsibility to care for their fleshy domains.⁴ This does not mean, however, that humans may not take any risks or exercise certain freedoms; indeed they may and should—within limits, of course.

Insofar as stewardship of our bodies is part and parcel of what it means to be human, developing strategies and techniques to care for those bodies is thus obligatory. This responsibility complements the understanding that God is a healer if not the ultimate healer and that humans nonetheless function as God's partners and agents in healing processes. As human agency is necessary to actualize human health, the next question is to what end: what goal or goals should human healing efforts pursue? Building on biblical texts, the rabbis articulate that at base humans are duty bound to do

what is necessary for returning the ill to wellbeing and for preserving health.⁵

The charge to preserve life thus becomes the basis for most if not all Jewish medical practices. This is encapsulated in the phrase *pikuach nefesh*, which literally means to 'open a life' since the Talmudic reference speaks of uncovering someone trapped in the rubble of a collapsed building.⁶ It is unclear, however, precisely what constitutes existential danger that would trigger the mandate of *pikuach nefesh*. Must the beneficiary of human intervention be a specific person, or could it be an abstract one, like *someone* suffering a particular lethal (or morbid) condition? And how much injury or pain must one suffer before one qualifies for this kind of attention? And who is obliged to offer medicinal intervention? Could a hypothetical future person suffering debilitating genetic disease be a sufficient cause to motivate action today—like stem cell research? The rabbis answer many of these and related questions by ruling that health measures must be taken even on Shabbat. That is, health trumps religious strictures. Exceptions exist, though. If one is being forced to murder another human, or if one is tyrannized to practice idolatry, or if one is coerced to

engage in illicit sexual relations—these are causes to forfeit one’s life.⁷ And we should remember that biblical and even rabbinic Judaism countenanced capital punishment, which means that at least in principle some human life may be forfeited if not destroyed.⁸ So though the presumption that human life is sacred, not all human life must be preserved in every instance.

Related to this exception regarding the undesired yet permissible termination of life is moral stature at the beginning of life. Full moral status, replete with all the responsibilities and protections afforded to adults, accrues in stages; it is not given the moment an ovum is fertilized. Rather, moral significance intensifies not with fetal development per se but with time (more will be said about this below). Emergence from the birth canal affords the newborn significant moral stature but not the same as is given to adults. Only through time and with physical development does a young baby and child gather moral stature. To illustrate, a post-partum baby is unnamed until the 8th day when it is ceremonially welcomed into the Jewish community. Were a baby to die within its first month, no *Shiva* or week of mourning is performed nor the regular recitation of the *Kaddish* prayer during the next

year. A child is not culpable for his or her actions as would be an adult until that child begins to manifest evidence of puberty; this is recognized through *bar/bat mitzvah* ceremonies in which a young person is welcomed as a full-fledged adult member of the community, morally and legally responsible for his or her actions. That moral stature grows and intensifies through time obviously has implications for our discussion here of stem cells, especially those extracted from embryos.

Sources of Stem Cells

Jewish attitudes toward the development of pluripotent stem cells varies regarding on the source of those cells. Suppose blood taken from an adult (anyone post-partum) could serve as a source of cells adequate for inducement to pluripotency; the question would arise whether bloodletting itself is permissible. Indeed it is—for both therapeutic and preventive measures.⁹ Moreover, it is permissible for an adult to give blood as frequently as once per month.¹⁰ Thus it would seem that stem cells derived from adult somatic cells engenders no resistance. Research along these lines can and perhaps should be pursued.

Things become a bit more complicated when using blood

taken from umbilical cords. At least in Ezekiel's time, it may not have been customary to cut the umbilical cord at all (Ezekiel 16:4). This throws into question how a newborn finally gains separation from the placenta. Be that as it may, the rabbis of the Talmud rule that umbilical cords must be cut when twins are born lest one become lethally entangled in them.¹¹ They also extend this rule even to singletons: "the umbilicus must be tied, the placenta cut and hidden, so that the [single] newborn may be kept warm."¹² It is unclear what keeping a newborn baby warm actually means. Does it mean that the baby should receive all the blood in the umbilicus before it is severed? Or does it mean that the umbilicus should be cut and removed quickly so the child can be covered or held closely by the mother or other adult? If the former, this teaching might curtail Judaic permission of extracting umbilical blood for ulterior purposes. The latter, obviously, does not hamper this strategy.

In relation to this the rabbis contemplate the scenario of a child born in the eighth month after conception.¹³ They rule that the Sabbath may not be desecrated by cutting its umbilical cord. This does not apply for a child born only after seven months

of gestation, however. For this premature birth, the umbilical cord is to be cut and the placenta buried so the child can be kept warm—that is, Shabbat may be desecrated for this child. If it is uncertain whether the newborn emerges in its seventh or eighth month, the assumption is to be conservative (that is, religiously, not biologically) and not profane the Sabbath by cutting its umbilicus. This does not mean that children born after 8 months of gestation (or thereabouts) never have their umbilical cords cut; rather, it means that theirs are severed only after the conclusion of the Sabbath in which they were born. Certainly, we can assume that by that time all the blood that had been in the umbilical cord would have drained into the newborn. Though this ruling stipulates when umbilical cords may (not) be cut for a newborn, in many situations it precludes the possibility (and hence the permissibility) of extracting umbilical cord blood for ulterior purposes.¹⁴

The most controversial sources—as well as the most promising sources—of pluripotent stem cells are those that come from embryos. Not all embryos are alike, to be sure. It should be acknowledged that 30-50% of all fertilized eggs do not implant, and that near 20% of known pregnancies

spontaneously miscarry within the first 20 weeks of gestation. This means that perhaps as many as 60% of all fertilized eggs never reach viability (~26 weeks, though even this would entail significant neurological complications). The question thus arises whether using pluripotent stem cells from those naturally aborted embryos is permissible. A further question is whether embryos purposefully aborted may be similarly permissible. A third question regards those embryos—zygotes, to be precise—that otherwise would be implanted during in vitro fertilization procedures but are no longer needed or desired by the intended parents: would using them for stem cells be permissible? A fourth concern regards the intentional creation of zygotes for the sole purpose of extracting stem cells; their creation is never meant for reproduction per se. All four sources—naturally discarded, purposefully aborted, supernumerary IVF zygotes, and lab-created zygotes—are all viable sources: pluripotent stem cells *can* be derived from them. And all are relatively abundant.¹⁵ So our question is not *if* but *may* any of these be sources for pluripotent stem cells.

In regard to spontaneously aborted embryos, we must determine its moral status before

we can decide whether they may serve as sources for the stem cells we seek. The classical rabbinic source on this subject is the Talmud in which the rabbis discuss whether a woman married to a priest may consume a particular kind of sacrifice that she could avail herself of were she not pregnant. Rabbi Hisda teaches that a woman may eat this sacrifice up to the 40th day of gestation, because up to that point the embryo is considered only water (*maya b'alma hee*).¹⁶ The medieval sage, Rabbi Shlomo ben Yitzhak (also known as Rashi), clarifies that it is only on (or after) the 40th day that the embryo becomes formed.¹⁷ The early rabbis rule that when a woman miscarries within the first 40 days of gestation she is not required to perform the usual cleansing rituals for a later miscarriage or formal birth.¹⁸ Again, this is because it is assumed that an embryo younger than 40 days has not achieved sufficient physical formation to merit even minimal moral status.

After the 40th day its status changes, but it does not acquire the same status as an independent adult or even a born child, however. Rather, it is assumed that the embryo is a part of the mother.¹⁹ Certainly this will have implications for induced abortions—as will be discussed momentarily. In regard

to spontaneous abortions, it means that what emerges from the mother should be treated as if it had been a part of the mother, like her thigh, as the Talmud says.²⁰ That is, a second-trimester embryo naturally miscarried should be viewed as more morally valuable than mere fluid but less than a full human.²¹ These and other texts reflect an enduring Jewish worldview that moral status of humans accrues through time and not at the supposed instant of conception (which science has proven takes time, perforce challenging those theologies claiming otherwise and that ensoulment happens in that particular moment).²² We can therefore surmise there are no legal or moral barriers to deriving scientific and medical benefit from the pluripotent stem cells derived from spontaneously aborted embryos.

Intentionally aborted embryos, on the other hand, pose a more significant legal and moral challenge. Jewish deliberation about therapeutic abortion begins with a biblical text found in the chapter immediately following the promulgation of the 10 Commandments, a textual location suggesting its relative import.

When men fight, and one of them pushes a pregnant woman and a miscarriage results, but no other damage ensues, the

one responsible shall be fined according as the woman's husband may extract from him, the payment to be based on reckoning. But if other damage ensues, the penalty shall be life for life....²³ This classic text reinforces the position that an embryo is *not* valued morally or legally the same as an independent human being; monetary compensation is suitable for the loss incurred.²⁴ Some might argue that this holds only if the loss of the embryo was not the primary goal but an unintended consequence. The rabbis disagree: for them, the principle holds even for those scenarios of intentionally causing a miscarriage. For example, if an embryo's existence or emergence endangers the mother, it is to be dismembered and removed.²⁵ This is no crime, and no compensation to the husband is necessary. This became the rule in the medieval period when Moses Maimonides codified it: "when a woman has [life threatening] difficulty giving birth, one may dismember the embryo in her womb—either by drugs or by surgery—because [the embryo] is like a pursuer seeking to kill [the mother]."²⁶ This ruling echoes the position taken by the Talmudic rabbis that no delay is required for a pregnant woman scheduled to die for a capital crime; the embryo is to die with

her. Indeed, the court instructs that it would be best for the embryo to be killed prior to her execution lest she be disgraced by its bloody natural expulsion after her death.²⁷ Though it is obvious in these latter texts that the concern is the speedy execution of justice, they nonetheless reinforce the overarching attitude that an embryo not yet in the process of being born has no legal or moral standing that prevents or complicates judgment and punishment against the adult woman in whose womb it resides. It is not a human life as such. This attitude is highlighted by the ruling that once the embryo's head breaches the birth canal, no such lethal interventions may be taken against it.²⁸

Contemporary scholars continue the debate about the permissibility of inducing abortions. While there are too many scholars to survey here, suffice it to say that the vast majority permits and even requires abortion when the mother's life is at risk. Many also permit second-term abortions in the case of genetic diseases, rape, or medically-caused malformations like thalidomide. Even though a select few hold the position that all abortions are prohibited, and at the other extreme some contend that nearly any reason is sufficient warrant for an

abortion—most Jewish scholars and clergy maintain that abortion is a lamentable yet permitted procedure in certain circumstances, and that no legal punishment or moral condemnation should be imposed. So, like naturally occurring miscarriages, we can conclude that extracting stem cells from intentionally aborted embryos would be permissible.

The third source—super-numerary IVF zygotes—raises fewer concerns. Insofar as frozen zygotes cannot become human beings in either their current frozen state or thawed in a petri dish but only if and when they become implanted within a human womb, there is no question of their moral status: *at most* they can be considered “merely water.”²⁹ If zygotes less than 40 days old within the womb have no moral or legal status, then all the more so would zygotes *ex utero*. Certainly it would be ideal for these otherwise unwanted zygotes to be given over to couples and individuals who cannot conceive on their own. Insofar as this does not happen, these zygotes may be and are discarded. Though there may be no legal or moral reason preventing them serving as sources for pluripotent stem cells, concern arises to their utilization for such purposes because it requires rendering otherwise

healthy zygotes inanimate. So we question whether government monies should be used to kill that which is currently healthy to help at some future point those who are unhealthy.

Finally, what about creating zygotes for the sole purpose of destroying them in the extraction of their pluripotent stem cells? Problems arise not in regard to the zygotes (as seen in the preceding paragraph) but to their very creation. On the one hand men are discouraged (some say prohibited) from ejaculating if not for the purpose of procreation.³⁰ This concern can be met by claiming that such efforts are to assist advancing scientific knowledge and medical healing powers. On the other hand, extracting eggs requires women to take drugs to stimulate hyperovulation, and evidence exists that this may increase risks for various kinds of cancer and other health problems.³¹ These real risks to the individuals involved may outweigh the possible collective benefits derived from extracting those eggs, constructing zygotes, and removing their pluripotent stem cells.

Ethical Calculus

There are several ways to weigh ethical concerns regarding the pursuit of stem cell research.

Consequential arguments usually try to balance the purported benefits of stem cell research against the risks entailed in extracting them. As noted at the outset, regardless of how the cells are procured, the benefits of such research are the same, including improved knowledge of cellular development and DNA functioning, ex vivo drug experimentation, and construction of homogeneous fluids, tissues, structures, and organs. The risks, however, differ according to the potential source.

Consider. Using adult cells as the source for pluripotent stem cells entails few risks, and fewer still that would have such moral suasion as to curb this line of research. The major concerns here are the relative cost of overcoming the technical challenges (as compared to the cost of deriving cell lines from other sources) and the biological limitations these cells pose. The first is a logistical challenge and can be met and/or justified. The latter may prove to be insurmountable, but only further research can tell.

Umbilical stem cells, by contrast, are more difficult to source than adult cells, but their potential to offer biologically sound pluripotent stem cells is far superior. This does not mean that every umbilicus should be considered a non-

question-begging source for cells. In some circumstances the Judaic tradition mandates that a cord remain attached to a newborn until cutting may be done without profaning the Sabbath, depending on the gestation age of the newborn. This means the *immediate and real* wellbeing of this particular person trumps the *future and potential* wellbeing of uncertain others.

Scientifically the most promising source for pluripotent stem cells are those derived from embryos. In regard to spontaneously aborted embryos and especially those younger than 40 days, there are hardly any barriers to their serving as a source. Nevertheless, there are practical challenges to gathering these embryos hygienically, as most if not all are expelled in settings beyond the clinic and lab. This thus adds pressure to gain access to those embryos that are expelled in hygienic settings, that is, to those that are intentionally aborted. While there is general Jewish support permitting abortion in certain circumstances, the permissibility of using aborted embryos as sources of pluripotent stem cells should not serve as a reason in and of itself for any abortion. The potential generic benefit intimated by stem cell research is no warrant for the termination

of any specific pregnancy. This thus inverts the calculus we saw regarding umbilical stem cells: the future and potential wellbeing of uncertain others does not trump the immediate and real wellbeing of this particular embryo. Though, of course, when there are other compelling reasons justifying a particular abortion, use of those embryonic stem cells may be permitted.

One might think the use of ex utero zygotes pits the obligation to procreate against the obligation to heal.³² But there is a significant difference between those that are frozen for IVF purposes from those that are created for the sole purpose of being destroyed en route to providing stem cells. The only difference pertains to their original purpose. Supernumerary zygotes were intended to fulfill procreative purposes, but now that they are no longer needed or wanted they are, biologically, no different than those created for the sole purpose of being sources of stem cells. So where is the issue of harm here? It comes back to the very process of pharmacologically stimulating a woman to hyperovulate and the risks involved in taking those drugs and hormones. Thus the ethical challenge here is between the real risks to these particular women and the possible benefit

to unknown future others. Insofar as modern Jewish bioethicists generally endorse the limited use of hormones to stimulate hyperovulation for procreative purposes for those women for whom it makes sense, it would only be consistent that that same level of exposure to risk be extended to women to hyperovulate for the purpose of creating zygotes for healing others. To be sure, this does not mean all pre-menopausal women can or should take hormones to hyperovulate for the purpose of creating zygotes. Rather, it means that if a woman chooses to contribute her DNA to this project, she may—because persons may take on certain (but not unreasonable or unlimited) levels of individual risk for the welfare of unknown others. This assumes, of course, that women not wanting to have children are willing to avail themselves to these kinds of risks. Perhaps a sharper question refers to those frozen eggs already taken from women for procreative purposes that have yet to be fertilized: may they be used for a different purpose, that is, may they be used to create zygotes for stem cells? In this situation—which is perhaps more realistic than imagining a population of women vying to give their DNA only for research—the dangers of hyperstimulation are

no longer an issue since the eggs are already *ex utero*. The issue thus seems to be not one of harm but one of consent: whether a woman consents to have her DNA used for research instead of procreation.³³

The aforementioned ways of thinking demonstrate consequential reasoning; they demonstrate a powerful way of calculating what to do by taking harms and benefits into consideration. But it is not the only way, nor the only Jewish way, of thinking through morally fraught possibilities. Another way of reasoning is more deontological, looking to overarching duties, rules, or principles that should guide our decision-making. For example, some bioethicists point to the theological claim that human beings are created in the image of God. This claim is considered sufficient warrant to conclude that no matter how “prehuman” an entity may seem “we certainly are not obligated or even permitted to kill an embryo for the more indirect benefit of the advancement of possibly helpful scientific information.”³⁴ Though this may seem like a consequential argument, it is not. It is a form of Kant’s categoricalism: humans (and their DNA) may not be treated as means to an end, but only as ends in and of themselves. One question to levy against this line of

reasoning is why that foundational claim (e.g. *imago dei*) should constrain or frame our thinking instead of (or more than) another foundational claim (e.g. *pikuach nefesh*). For example, it could very easily be reasoned that the duty to heal (including all the research healing requires) should trump the idea that all humans are made in God's image. To address this conundrum, even more abstract or meta-ethical values would need to be identified to help us discern which of these foundational claims should lead our calculus.

From the outset it is reasonable

to say that the Judaic textual tradition can endorse research using pluripotent human stem cells. Things get complicated when we consider how best to source those stem cells. The least non-question-begging source of stem cells, besides adult ones, would be those extracted from supernumerary zygotes, as they have already been created and have no further utility. Contributing to the benefit of future unknown people should be considered a sufficient good, at least in this regard.

Notes

¹ Kazutoshi Takahashi, Shinya Yamanaka, 2006, 'Induction of Pluripotent Stem Cells from Mouse Embryonic and Adult Fibroblast Cultures by Defined Factors.' *Cell*, 126, 4, pp. 663-676; Yu J., Vodyanik M.A., Smuga-Otto K., Antosiewicz-Bourget J., Frane J.L., Tian S., Nie J., Jonsdottir G.A., Ruotti V., Stewart R., Slukvin II, Thomson J.A., 2007, 'Induced pluripotent stem cell lines derived from human somatic cells.' *Science*, 318, 5858: pp.1917-20.

² Greish S., Abogresha N., Abdel-Hady Z., Zakaria E., Ghaly M., Hefny M., 2012, 'Human umbilical cord mesenchymal stem cells as treatment of adjuvant rheumatoid arthritis in a rat model.' *World J Stem Cells*, 4, 10: pp.101-9. doi: 10.4252/wjsc.v4.i10.101; Ratajczak M.Z., Machalinski B., Wojakowski W., Ratajczak J., and Kucia M., 2007, 'A hypothesis for an embryonic origin of pluripotent Oct-4+ stem cells in adult bone marrow and other tissues.' *Leukemia*, 21, pp. 860-867, doi:10.1038/sj.leu.2404630.

³ See, for example, Vazin T., Freed W.J., 2010, 'Human embryonic stem cells: derivation, culture, and differentiation: a review.' *Restorative neurology and neuroscience*, 28,4: pp. 589-603.

⁴ See Exodus 19:5; Deuteronomy 10:14; Psalms 24:1. There are significant philosophical and theological problems to the argument that humans are sacred because they are *betzelem elohim*, created in God's image (Genesis 1:28). Not only is this claim scant in the bible (mentioned only again at Genesis 5:1 and 9:6), it is unclear (a) what *tzelem* means (it can mean shadow, idol, or image); (b) what the precise physical features of the original are (i.e., God; this is problematic since God is presumed not to have a physique); and (c) where the precise boundaries of God's image actually exist (e.g., if cognition is taken to be a quintessential feature of God and thus of humans, science demonstrates that some animal species share many of these cognitive capacities; consistency would mandate appreciating those animals as also "images of God").

⁵ Deuteronomy 22:2; Exodus 21:19; Leviticus 19:16; Leviticus 18:5; BT *Bava Kamma* 85a; BT *Sanhedrin* 73a; BT *Yoma* 84b-85a.

⁶ BT *Yoma* 84b. Some might look to these biblical texts to ground the claim that all interventions may be done to save a life: Leviticus 18:5; Ezekiel 20:11, 13 and 33:15; Nehemiah 9:29; Deuteronomy 4:1.

⁷ See discussion embedded within BT *Sanhedrin* 72-74.

⁸ For but one example, see M *Sanhedrin* 4.5.

⁹ See Julius Preuss, 1993 [1911], *Biblical and Talmudic Medicine*, 248-256. Originally published in German, Fred Rosner (trans.), Northvale: Jason Aronson Press.

¹⁰ BT *Shabbat* 129b.

¹¹ Ibid.

¹² Ibid.

¹³ *Bamidbar Rabbah* 4.3; *Midrash Tanhuma*, *Bamidbar* 9b. They make this ruling based on BT *Shabbat* 135b (which speaks of circumcising a premature boy on its 8th day post-partum) and *Tosefta Shabbat* 16.

¹⁴ We should note that these practices were codified no later than medieval Jewish law. SA *Orach Chayim* 330.7.

¹⁵ Estimates put the number of supernumerary frozen zygotes in fertilization clinics in the United States alone between 200,000-400,000. Naturally discarded embryos, of course, will exist as long as humans reproduce. And no matter how hard authorities struggle to regulate or outlaw abortion, it has been a feature of nearly every civilization from time immemorial. Lab-created zygotes is technically feasible; the procedure merely awaits legal protection and funding.

¹⁶ BT *Yevamot* 69b.

¹⁷ Rashi, BT *Yevamot* 69b, s.v., *tovelet*. Elsewhere, the Talmud and Rashi assert that a female embryo becomes formed after the 40th day, perhaps as late as the 80th day. See BT *Niddah* 30b; Rashi, BT *Niddah* 30b, s.v., *v'dilma ee karveha*, and *b'simaneihon shavin*; *Tosefta, Niddah*, 4.17. These texts portray a rather gruesome experiment done by Queen Cleopatra who forced pregnant female prisoners to drink an abortifacient concoction so as to observe the development of their embryos.

¹⁸ M *Niddah* 3.7. See also Rashi, BT *Niddah* 30a, s.v., *ainah chosheshet le-valad*.

¹⁹ BT *Arachin* 7a. There, it is ruled that it is unnecessary to wait for a pregnant woman who is scheduled to die for a capital crime to give birth, for the embryo is only a part of her body. That is, the embryo is neither "merely water" nor an independent being deserving of separate moral concern.

Another way to appreciate this difference is in regard to what can be seen. Up to this point of its development, an embryo is too small to be seen by the naked eye. After the 40th day, it slowly comes into the visual field with, among other things, the formation of a thread that eventually becomes the spinal cord. In the view of J. David Bleich, such "subvisual" entities are of no legal or moral consequence in the Judaic legal tradition. See his 2002, 'Stem Cell Research,' *Tradition*, 36,2, pp. 65-67.

²⁰ See BT *Chullin* 58a. Since this text regards pregnant animals to be sacrificed, some may balk at importing it to speak about human embryology and the status thereof.

²¹ Thus, when the rabbis rule about the possible injury sexual intercourse may impose upon an embryo during the first trimester (but it is beneficial for the embryo in the latter two trimesters), it bespeaks a perspective that the embryo's wellbeing should be taken into consideration. Still, it need not be the ultimate, or even a partial, arbiter about what can or should be done with a pregnant woman.

See BT *Niddah* 31a.

²² See the various discussions between Antonius and R. Judah about the precise timing of ensoulment. BT *Sanhedrin* 91b; *Bereshit Rabbah* 34.10. For other stories about some kind of ensoulment happening within the uterus, see Daniel Schiff's excellent 2002, *Abortion in Judaism*, New York: Cambridge University Press, p. 43.

²³ Exodus 21:22. Translation taken from the new 1999, *JPS Hebrew-English Tanakh*, Philadelphia: The Jewish Publication Society.

²⁴ Rashi clarifies that the payment is the difference between the going price for a pregnant female servant and an unpregnant one. Rashi at Exodus 21:22, s.v., 'anosh ye'anesh. See also BT *Baba Kamma* 49a; Deuteronomy 22:19.

²⁵ M *Ohalot* 7.6; Rashi, BT *Sanhedrin* 72b, s.v., *d'chol zaman*.

²⁶ MT *Rotzeach* 1.9.

²⁷ M *Arakhin* 1.4; BT *Arakhin* 7a.

²⁸ MT *Rotzeach* 1.9. Nachmanides opines that it is required to break Sabbath rules to protect the life of even an embryo because of its potential to be an upstanding Jew (*Torat HaAdam, Inyan Sakanah*, §6, p. 29); see also BT *Arakhin* 7a. Rabbi Naftali Tzvi Yehudah Berlin disagrees, reasoning that since an embryo is not a person, no permission is granted to break Sabbath rules (*Ha'amek Sh'eilah to Shiltot* 167.17).

²⁹ Elliot Dorff makes this argument in his 2003, 'Stem Cell Research,' *Conservative Judaism*, 53,3, p. 19.

³⁰ See discussion of classic sources in Elliot Dorff's, 1998, *Matters of Life and Death: a Jewish Approach to Modern Medical Ethics*, Philadelphia: Jewish Publication Society, pp. 116-120.

³¹ For example, see Fei C., Deroo L.A., Sandler D.P., Weinberg C.R., 2012, 'Fertility drugs and young-onset breast cancer: results from the Two Sister Study.', *Journal of the National Cancer Institute*, 104,13: pp. 1021-7. doi: 10.1093/jnci/djs255.

³² It should be clarified that what is spoken to humankind in Genesis 1:28 (and earlier to animalkind in Genesis 1:22)—"be fruitful and multiply"—is not a command (*mitzvah*) per se but a blessing (*brachah*). The first command, as such, occurs in Genesis 2:16, when God commands the primordial human to eat carefully or suffer lethal consequences.

³³ Another complicating factor to consider is the marketplace. Should donors of DNA—whether it is directly for research or indirectly once procreation needs have been fulfilled—be remunerated, especially when financial gains may come from the research derived therefrom? This concern is critical, but beyond the scope of this essay.

³⁴ David Novak, 2007, *The Sanctity of Human Life*, Washington DC: Georgetown University Press, p. 68.



The Anatomy Lesson: Rembrandt

Erasmus Darwin's Impact on Religious and Scientific Views of English Romanticism

By Alan S. Weber

Erasmus Darwin (1731-1802) is primarily remembered today as a precursor of his grandson Charles Darwin's theories of evolution, and secondly as a poet and serious medical scientist, although he was a much-celebrated versifier in his day and briefly one of England's most popular poets. His style and poetic vision were quickly eclipsed by the Romantic Movement, however, and the explosion of scientific inquiry in the 19th century, but his influence, particularly the medical treatise *Zoonomia* and the scientific poems *The Botanic Garden* and *The Temple of Nature*, can be clearly traced in Wordsworth, Coleridge, Keats, Byron and the Shelleys.

A monograph by Desmond

King-Hele on Darwin's impact on the Romantic poets uncovered many parallel passages and verbal echoes.¹ I would like to trace Darwin's influence on William Wordsworth and Samuel Taylor Coleridge specifically using a macro-historical and history of ideas perspective to contextualize Darwin's impact within late 18th century intellectual culture—specifically radicalism, materialism, and spirituality. John Livingston Lowes was perhaps the first modern critic who recognized that Darwin's verse and prose had cast a long shadow into the early Romantic period and helped frame the Romantic poets' views of science, theology, and poetry.² After an initial attraction

to Darwin's radical politics and approach to scientific poetry, however, both Wordsworth and Coleridge rejected both his aesthetics and world view. The 'Preface' to Wordsworth's and Coleridge's *Lyrical Ballads* is believed by some scholars to be a veiled diatribe against Darwin.³

Erasmus Darwin was a Cambridge and Edinburgh educated successful physician practicing in Lichfield, and a Royal Society fellow who published on a variety of scientific topics and invented several mechanical devices such as a vertical windmill.⁴ Darwin translated Linnaeus's Latin treatise *Systema vegetabilium* in 1783 which categorized plants by their sexual organs. He then somewhat comically versified the Linnaean system as the immensely popular poem *The Loves of Plants*, published along with *The Economy of Vegetables* as *The Botanic Garden* (1789-91).

Darwin's work supported the natural theology of John Ray and William Paley, the school of religious thought that used the argument of the complexity of nature as proof for a creator (in other words, a non-random and non-accidental creation presupposes a creator, or previous intelligent cause). The Romantic nature poets similarly celebrated the wisdom of nature as a divine

plan. Many of Darwin's theories of nature were unorthodox to European Christian conventional wisdom—the evolution of species from an original filament, the great age of the earth (much older than Bishop Ussher accepted 5,800 years), and his doctrine of survival of the fittest.⁵

Zoonomia and Mechanism

Darwin's *Zoonomia* (vol. 1, 1794; vol. 2, 1796) is both a product of the age in its praxis and a novel theory of medicine. His therapeutics are based ultimately on Galen and Hippocrates, and include emetics, cathartics, and phlebotomy or venesection (bloodletting). His pharmacopeia relies heavily on bark (cinchona or quinine) and opium, the scourge of many patients including the addicts Tom Wedgewood (Darwin prescribed his opium) and Wedgewood's friend Coleridge. Darwin also prescribed electrotherapy for muscle paralysis. *Zoonomia* was clearly written to be definitive, systematic, and comprehensive; a writer for *The European Magazine* claimed that *Zoonomia* "bids fair to do for Medicine what Sir Isaac Newton's *Principia* has done for Natural Philosophy."⁶

The stated purpose of *Zoonomia* was to "reduce the facts belonging to ANIMAL LIFE into classes, orders, genera, and

species; and, by comparing them with each other, to unravel the theory of diseases."⁷ Based on his work on Linnaeus, Darwin attempted to bring rational order to human disease by a Linnaean division of illness into four Classes, Orders, and Genera. The four classes correspond to the four categories of Darwin's *sensorium*, also called the *spirit of animation*: Diseases of Irritation, Volition, Sensation and Association. His immediate theoretical sources were Hermann Boerhaave (1668-1738), John Brown (1735-1788), William Cullen (1710-1790), and Thomas Beddoes (1760-1808). Cullen was generally a mechanist, but believed in a non-material principle of thought. Boerhaave, who emphasized the mechanical and hydraulic nature of the body's systems, wrote his 1690 dissertation at the University of Leiden on the difference between the mind and body, and also condemned the materialist and atomist philosopher Epicurus. Darwin in the Preface to *Zoonomia* complained about those who "considered the body an hydraulic machine." However, it is difficult to see how his physiological system differed substantially from an overall materialist view of the human organism.

Mechanist explanations of human physiology which were

independent of or glossed over the need for a Creator or interventionist God became more numerous in the eighteenth century. La Mettrie published his controversial *Histoire naturelle de l'âme* in 1745, then the atheistic *L'homme machine* in 1748, a refutation of Cartesian dualism. La Mettrie's work claimed that the soul was governed by a self-motivated *force motrice*, and mental phenomena (centered in the brain and the nervous system and causally connected to exterior phenomena by direct physical proximity) are completely grounded in the natural world. The endpoint of La Mettrie's controversial natural philosophy is biological determinism in which all aspects of cognition, emotion, sensation, motivation, and behavior etc. are ultimately quantifiable and measurable processes which are self-moved.

The ancient philosophers Lucretius and Epicurus had posited essentially the same materialistic system in their theory of atomism. In this view, there is no need of Revelation or an Intelligent Creator, and both atomist philosophers and their followers were attacked throughout history for denying providence, the immortality of the soul, and the reality of gods. All causation in classical atomic theory arises from the random combination of atoms,

not from divine fiat. Biological and mechanistic fatalism (strict determinism) is unpalatable to Christian theology because the soul requires free will to choose good over evil. In the early medieval period, Christian fathers such as Gregory of Nyssa had launched lengthy and detailed attacks on Stoic and pagan *fatum*. They also dismissed astrology, the idea that celestial and planetary positions determined an individual's temperament (horoscopes) and future actions.

Albrecht von Haller believed that the body was essentially an animated and hydraulic automaton. Darwin, along with Stephen Hales and La Mettrie (*L'homme plante*), also saw strong analogies between plants and animals, i.e. between the vascular system of higher plants and human blood vessels and arteries, and this was an attractive concept for both natural theology and the Romantics (demonstrating the unity of nature); Christian theology in the 18th century, however, made a greater distinction between man and other living beings, with man as the only rational being with free will, thus the only creation capable of loving God and singled out for a special providence.

In Darwin's *Zoonomia*, corporeal movement as well as psychological functions are gover-

ned by a *spirit of animation* (also called the *sensorium* or sensorial power), which causes contraction of animal fibers. The spirit or sensorial power possesses four faculties: irritation, sensation, volition, and association. Darwin hypothesized that "the spirit of animation, may consist of a matter of a finer kind...and [I] leave the consideration of the immortal part of us, which is the object of religion, to those who treat of revelation."⁸ The final statement claiming ignorance of the theological implications of his theory of mind (soul) is typical of Darwin throughout his poetry and prose, technically making him an agnostic in religion, although this term was not in use at the time. Darwin's subtle (possibly material) spirit of animation which causes both mechanical movement and mental phenomena seems akin to the pneumatic medical spirits of Galen, which many classical and medieval medical writers had theorized to be simply rarefied, material air (*pneuma*).

Darwin speaks very favorably of the material doctrines of ancient atomism, and he seems to believe that it could be salvageable as a philosophy of nature simply by ascribing the random atomic combinations of Lucretius to natural laws instituted by a creator.⁹ Fara has found Lucretian

references in Darwin and Logan has suggested an important Lucretian parallel in *De rerum natura* to Darwin's theories describing how the soul perceives sensory data.¹⁰ In a perfectly mechanistic chain of events, Lucretius's atoms of mind strike the atoms of spirit and move the atoms of the body. La Mettrie also believed like the Stoics that there was only one material substance in the universe existing in different modifications, thus his explanations of the faculties of an immaterial soul could be explained materialistically. Hassler argues similarly that "Darwin's physiology and psychology are grounded in a univocal matter theory. Spirit becomes no different from matter"¹¹. In Darwin's own time, Thomas Brown wrote *Observations on the Zoonomia of Erasmus Darwin* (Edinburgh, 1798) to refute Darwin's medical hypotheses and to demonstrate that he was simply a materialist.

The Romantics' Aversion to Materialism and Mechanism

Darwin's inquiries into the minutiae of the workings of nature and the necessary precision required by both scientific experimentation and the practice of medicine was inimical to the streams of Romantic thought and art that became the Gothic, nature worship, and certain forms of symbolism (the

Swedenborgianism of Baudelaire and Rimbaud, for example), and aesthetic interest in the sublime. Modern science does not generally tolerate ambiguity – terminology must have one and only one meaning; this is fundamental to scientific discourse. Darwin's versifying of the sciences (for example, the Linnaean system of sexual differences in plants), merely involved finding different (anthropomorphized) metaphors for the scientific facts of plant pollination. The Symbolism of the Romantics, although similarly based on metaphor and analogies, was meant to expand meanings and find interconnections.

The scientific analogy of Darwin, on the other hand, was a logical tool to discover the closest parallel phenomena; i.e. the vascular structures of plants are very closely analogous to the vessels in the human body because both transport nutrients for their respective organisms. Philosophically, Darwin appears to have understood this distinction between poetic and scientific analogy clearly, as Griffiths has argued: "Yet Darwin sounds a cautionary note, as analogy's potent associative power can also corrupt scientific inquiry: 'but when with licentious activity it [analogy] links together objects, otherwise discordant, by some fanciful

similitude; it may indeed collect ornaments for wit and poetry, but philosophy and truth recoil from its combinations...."¹² Coleridge and Wordsworth also seem to have recognized this distinction. For example, Wordsworth criticized those poets (Darwin seems to be intended) who "indulge in arbitrary and capricious habits of expression in order to furnish food for fickle tastes and fickle appetites of their own creation."¹³ What Wordsworth means is that poets like Darwin create unnatural and artificial metaphors and symbols instead of uncovering the true relationships between words and objects, a later avowed purpose of the Symbolist poets.

Wordsworth and Darwin

Matlak believes that Darwin impacted Wordsworth profoundly and Wordsworth urgently requested a copy of *Zoonomia* while he was composing his *Lyrical Ballads*.¹⁴ Darwin and Wordsworth both looked for a common sentience in all living beings as an expression of the goodness of the Creator in creating life. Wordsworth wrote in "Lines Written in early Spring": "And 'tis my faith that every flower / Enjoys the air it breathes,"¹⁵ expressing Darwin's exact sentiments in *The Loves of Plants*. But Chester Chapin has argued that the 1800

Preface to Wordsworth and Coleridge's *Lyrical Ballads* was a nervous refutation of Darwin.¹⁶ A contemporary critic in the *Edinburgh Magazine* similarly believed that Darwinian poetry was distinctly different from the Romantic Lake poets: "in matter, and in manner, the Lake and Darwinian schools of poetry are the very antipodes of each other – hostile in all their doctrines, and opposite in every characteristic."¹⁷

In an unpublished manuscript note, Wordsworth wrote: "my taste and natural tendencies were under an injurious influence from the dazzling manner of Darwin."¹⁸ The Advertisement to the 1798 edition of *Lyrical Ballads* seems to be specifically targeting Darwin's injurious influence by complaining of the gaudy, dazzling and inane phraseology of many modern writers.¹⁹ Many of the contemporary aesthetic criticisms of Darwin revolved around his use of ornament, gaudiness, and frippery – i.e. an artificial 'artfulness' predicated on artifice, as opposed to natural organicity. Thus we see an early nascent polarity in English thought between Darwin's 'artificial' human scientific endeavors, and the 'naturalness' of divinely created nature. This discourse could be easily coupled with 'the vanity of human learning' (*vanitas*

vanitatum) notion in Christianity which scorned human attempts to decipher through reason the complexity of God and God's creation, thus necessitating faith.

But Wordsworth's aesthetic critique of Darwinian poetry also had a serious epistemological aspect: Darwin's verse was not capturing the reality of experience – Darwin's analytical and empirical methods disguised as art killed off something essential about beauty, the expression of God's grandeur in nature. Wordsworth's "Tables Turned" and "Expostulation and Reply" express disgust with ratiocination and bookish learning:

Our meddling intellect
Mishapes the beauteous forms
of things;
–We murder to dissect.²⁰

In addition, in the 1802 Preface to *Lyrical Ballads*, Wordsworth promises no theoretical speculation, nor personifications of abstract ideas, a hallmark of Darwinian verse. Similarly, it is difficult not to believe that Wordsworth's "A Poet's Epitaph" (addressing a botanizing physician) is not a satire of Dr. Darwin:

Physician art thou? One, all eyes,
Philosopher! a fingering slave,
One that would peep and botanize
Upon his mother's grave?²¹
The botanizing of Darwin is here

accused of disrupting the natural order of spiritual taboos (the sanctity of a mother's grave).

Coleridge and Darwin

Ullrich counted thirty-five references to Erasmus Darwin in the first two volumes of Coleridge's Notebooks and eleven references in volumes I and II of his Letters.²² Coleridge was clearly impressed with Darwin's range of knowledge and accomplishments. Coleridge read widely in medicine, partly to find relief from his many afflictions, including textbooks on physiology, pathology, hygiene and materia medica²³. There might therefore have been some anxiety of influence in Coleridge's spiritual and intellectual rejection of Darwinism.

Coleridge visited Darwin in 1796 when he was 23. Coleridge wrote a letter about the meeting to Josiah Wade on 27 January 1796: "Derby is full of curiosities...Dr. Darwin, the everything, except the Christian! Dr. Darwin possesses, perhaps, a greater range of knowledge than any other man in Europe, and is the most inventive of philosophical men. He thinks in a new train, on all subjects except religion."²⁴ Coleridge also wrote to John Edwards that Darwin was interested in Coleridge's Unitarianism and had exposed himself as an atheist.²⁵ Despite his

intellectual admiration for Darwin, Coleridge wrote to Thelwall in 1796 about Darwin's *Botanic Garden*: "I absolutely nauseate Darwin's poem."²⁶ Similar to Wordsworth, Coleridge would later criticize Darwin's "gaudyverse" and the error of "Darwinizing."

The young Coleridge probably came away from the meeting in 1796 impressed with Darwin's vast knowledge, but also somewhat taken aback by Darwin's irreverence and his nettling him about Coleridge's Unitarianism. Charles Darwin wrote in his biography of his grandfather Erasmus: "Although Dr. Darwin was certainly a theist in the ordinary acceptance of the term, he disbelieved in any revelation....Nor did he feel much respect for Unitarianism, for he used to say that 'Unitarianism was a feather-bed to catch a falling Christian.'"²⁷ Despite Erasmus's mocking of conventional religion, however, Charles Darwin explicitly denies that his grandfather was an atheist. But the charge of atheism and materialism would dog Erasmus even in his lifetime. Darwin's friend Edgeworth wrote to him upon receiving a copy of *Zoonomia* that he was not fooled by Darwin's references to God, exposing Darwin as a mechanist and materialist who had no need for divine causation in his theories:

"Your Ens Entium is the same as your living filament—your God of your God!"²⁸

The context of an England fearing French radicalism, and intolerant of dissenting religions and the example of La Mettrie who was hounded from several countries for maintaining an atheistic materialism made Darwin circumspect about criticizing religion directly in his published writings. As Primer argues: "Darwin carefully avoids any overt implications of irreligion, theism, blasphemy and the like. There is a God, the Great Author of all things, the Ens Entium, and his existence is confirmed by the argument from design."²⁹ Charles Darwin would later face the same charges as Erasmus of materialism and atheism, and generally dodged the controversies by avoiding discussions of religion, or allowing champions such as Thomas Huxley ('Darwin's bulldog') to take up the gauntlet of evolution.

Since the early modern period, English physicians have suffered from a reputation for atheism, and Sir Thomas Browne's *Religio medici* (1643) was written in part to refute the popular aphorism 'ubi tres medici, duo athei' – where there are three physicians, two are found to be atheists. Until the late 19th century, European medicine was dominated by Galen and

Hippocrates, who had banished divine and metaphysical causation in diseases in his *De morbo sacro* (*On the Sacred Disease*), declaring that epilepsy or the falling sickness (commonly believed to be caused by demons or religious ecstasy) was no more sacred or mysterious than any other bodily ailment. Darwin's medical training, which in reality would have differed little from Sir Thomas Browne's, would have explicitly encouraged a secular view of physiology and psychology.

Other religious and spiritual implications of Darwin's scientific theories besides his dispensing with an active God in natural causation were equally troubling for Coleridge. Coleridge wrote to Wordsworth about the poem *The Excursion* expressing relief that he had rejected Darwin's notion of "Man's having progressed from an Ouran Outang state."³⁰ Thus in Coleridge's view, Darwin was denying any divinity in man because he was descended from a lower species, the same accusation that Bishop Wilberforce in a debate with Huxley would later level at Charles Darwin and the *Descent of Man*.

Conclusion

By end of the 19th century, theology and science had become divorced in a split that has been

simplistically dubbed 'the Two Cultures' by author C.P. Snow.³¹ The positivism of Auguste Comte was partially responsible for this division, due to his insistence that true scientists should only look for proximate secondary causes and not seek vainly after ultimate causes. More and more scientists quietly abandoned inquiry into first causes and primary movers, and specifically German experimentalism in sensory perception contributed to the secularization of psychology, which replaced theological models of the faculties of the soul. The final dismantling of untenable Aristotelian concepts of space, time, physics, metaphysics, biology, and generation (which had first come under serious attack from Copernican cosmology), which had been superimposed onto Christian theology by the scholastics and harmonized with revelation, also played a part in the decline of theology in natural philosophical inquiry. Erasmus Darwin at heart was probably a material monist, with sympathy for a materialistic atomic theory of matter, and troubled by the still scientifically unanswered question of what causes life. His attempt to answer such questions with mere mechanism and materialism in both a poetic garb, and in the medical treatise *Zoonomia*,

was not satisfactory spiritually, aesthetically or emotionally for the Romantics.

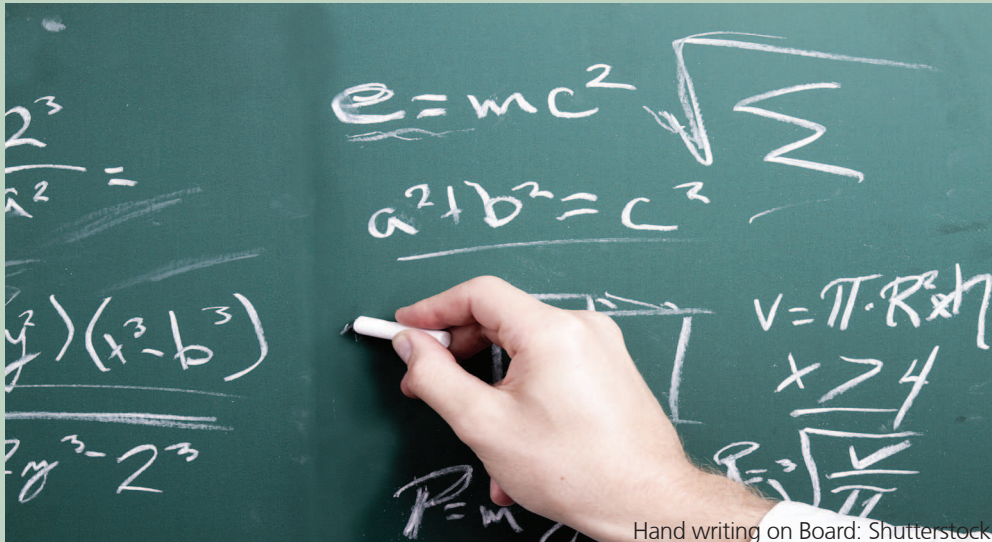
Thus, Hassler is probably correct in stating that Darwin's 'materialistic pessimism' "played an important role as a kind of negative catalyst for the Romantic Movement."³² Coleridge and Wordsworth in particular were prescient in envisioning that the Darwinian outlook, which

does in fact now dominate our modern scientific understanding of life (most current biological, psychological and physiological models are based on the laws of physics, chemistry, and mechanics), would have profound implications for the spiritual realm, and our human sense of wonder, mystery, devotion and awe in the presence of the divine.

Notes

- ¹ Desmond King-Hele, 1986, *Erasmus Darwin and the Romantic Poets*, London: Palgrave Macmillan; On Darwin and the Romantics, see also Desmond King-Hele, 1983, 'Shelley and Erasmus Darwin' in *Shelley Revalued: Essays from the Gregynog Conference*, (ed.) Kelvin Everest, Leicester: Leicester UP, pp. 129-46; Christine Lehleiter, 2011, 'On Genealogy: Biology, Religion, and Aesthetics in E.T.A. Hoffman's *Elixiere des Teufels* (1815-16) and Erasmus Darwin's *Zoonomia* (1794-96),' *The German Quarterly*, 84,1, pp. 41-60; Catherine Packham, 2004, 'The Science and Poetry of Animation: Personification, Analogy, and Erasmus Darwin's *Loves of the Plants*,' *Romanticism*, 10,2, pp. 191-208; Michael Page, 2005, 'The Darwin Before Darwin: Erasmus Darwin, Visionary Science, and Romantic Poetry,' *Papers on Language and Literature*, 41,2, pp. 146-69; Dahlia Porter, 2007, 'Scientific Analogy and Literary Taxonomy in Darwin's *Loves of the Plants*,' *European Romantic Review*, 18,2, pp. 213-221; Nicola Trott, 2001, 'Wordsworth's *Loves of the Plants*,' in 1800: *The New Lyrical Ballads*, (ed.) Nicola Trott and Seamus Perry, Houndsmill: Palgrave, pp. 144-68; Alan Richardson, 2001, *British Romanticism and the Science of the Mind*, Cambridge: Cambridge University Press; Richard Matlak, 1990, 'Wordsworth's Reading of *Zoonomia* in Early Spring,' *The Wordsworth Circle*, 21,2, pp. 76-81; Nicholas Williams, 2012, "Glad Animal Movements": Motion in Wordsworth's 'Tintern Abbey' and 'The Two-Part Prelude,'" *Partial Answers: Journal of Literature and the History of Ideas*, 10,1, pp. 11-28; Noel Jackson, 2009, 'Rhyme and Reason: Erasmus Darwin's Romanticism,' *Modern Language Quarterly*, 70,2, pp. 171-94; Desmond King-Hele, 1984, 'Disenchanted Darwinians: Wordsworth, Coleridge and Blake,' *Wordsworth Circle*, 25,2, pp. 114-18; David W. Ullrich, 1984, 'Distinctions in Poetic and Intellectual Influence: Coleridge's Use of Erasmus Darwin,' *Wordsworth Circle*, 25,2, pp. 74-80; John Harris, 1972, 'Coleridge's Readings in Medicine,' *Wordsworth Circle*, 3,2, pp. 85-96.
- ² John Livingston Lowes, 1955 [1927], *The Road to Xanadu: A Study in the Ways of Imagination*, Rev. ed., Boston: Houghton Mifflin Company.
- ³ Desmond King-Hele, 1968, *The Essential Writings of Erasmus Darwin*, London: MacGibbon and Kee, p. 163.
- ⁴ A. S. Weber, 2000, *19th Century Science*, Peterborough, Ont.: Broadview Press, pp. 26-27; Lord Cohen of Birkenhead, 1970-1980, 'Erasmus Darwin,' in *The Dictionary of Scientific Biography*, Charles Coulston Gillispie (ed.), New York: Scribner, pp. 577-81.
- ⁵ *Zoonomia; or, the Laws of Organic Life*, 1796, 2nd ed., corrected, vol. 1, London: J. Johnson, l.39.4.8, p. 503.

- ⁶ Qtd. in Desmond King-Hele, 1977, *Doctor of Revolution: The Life and Genius of Erasmus Darwin*, London: Faber and Faber, p. 241.
- ⁷ *Zoonomia*, vol. 1, Preface.
- ⁸ *Zoonomia*, vol. 1, 14.2, p. 109.
- ⁹ *Zoonomia*, vol. 1, 39.8.6.
- ¹⁰ Patricia Fara, 2012, *Erasmus Darwin: Sex, Science, and Serendipity*, Oxford: Oxford UP, p. 62; James Venable Logan, 1936, *The Poetry and Aesthetics of Erasmus Darwin*, Princeton: Princeton UP, pp. 29-30.
- ¹¹ Donald M. Hassler, 1973, *The Comedian as the Letter D: Erasmus Darwin's Comic Materialism*, The Hague: Martinus Nijhoff, p. 28.
- ¹² Devin S. Griffiths, 2011, 'The Intuitions of Analogy in Erasmus Darwin's Poetics,' *SEL Studies in English Literature 1500-1900*, 51,3, p. 647.
- ¹³ *Lyrical Ballads*, 1800, vol. 1, Preface, xii.
- ¹⁴ Richard Matlak, 1990, 'Wordsworth's Reading of *Zoonomia* in Early Spring,' *Wordsworth Circle*, 21, 2, p. 79.
- ¹⁵ *Lyrical Ballads*, 1800, vol.1, p. 93.
- ¹⁶ Chester Fisher Chapin, 1955, *Personification in Eighteenth Century Poetry*, NY: King's Crown Press, pp. 81-97.
- ¹⁷ *Edinburgh Magazine* 2, 1818, p. 313.
- ¹⁸ DC MS 151/4, 1842.
- ¹⁹ *Lyrical Ballads, With a Few Other Poems*, 1798, London: J. and A. Arch.
- ²⁰ 'The Tables Turned,' *Lyrical Ballads*, 1800, vol.1, p. 6.
- ²¹ 'A Poet's Epitaph,' *Lyrical Ballads*, 1800, vol.2, p. 166.
- ²² Ullrich, David W., 1984, 'Distinctions in Poetic and Intellectual Influence: Coleridge's Use of Erasmus Darwin,' *The Wordsworth Circle*, 25,2, p. 74.
- ²³ John Harris, 1972, 'Coleridge's Readings in Medicine,' *The Wordsworth Circle*, 3,2, p. 85.
- ²⁴ Earl Leslie Griggs (ed.), 1956-71, *The Collected Letters of Samuel Taylor Coleridge*, Oxford: Clarendon Press, Griggs (ed.), *The Collected Letters of Samuel Taylor Coleridge*, vol. I, p. 177.
- ²⁵ Griggs (ed.), *The Collected Letters of Samuel Taylor Coleridge*, vol. I, pp. 178-79.
- ²⁶ Griggs (ed.), *The Collected Letters of Samuel Taylor Coleridge*, vol. I, p. 216.
- ²⁷ Charles Darwin, 2003, *Charles Darwin's The Life of Erasmus Darwin*, (ed.) Desmond King-Hele, Cambridge: Cambridge UP, p. 63.
- ²⁸ 7 Sept 1794, unpublished letter at Cam. U. Lib.; qtd. in King-Hele, *Doctor of Revolution*, p. 251.
- ²⁹ Irwin Primer, 1964, 'Erasmus Darwin's *Temple of Nature*: Progress, Evolution, and the Eleusinian Mysteries,' *Journal of the History of Ideas*, 25,1, p. 66.
- ³⁰ Griggs, (ed.), *The Collected Letters of Samuel Taylor Coleridge*, vol. 4, pp. 574-5.
- ³¹ Strictly speaking, Snow's original distinction was between the humanities and science, but training in theology and preparation for the Church was accomplished in England through an education in literature, rhetoric, and the classics.
- ³² Donald M. Hassler, 1970, 'Comment on the Relation of Erasmus Darwin to the Wordsworth Circle,' *The Wordsworth Circle*, 1,2, p. 73.



Hand writing on Board: Shutterstock

Science and the Heart of Religion

By Philip Clayton

A famous Buddhist teacher once said, "To concentrate always on the differences between religions is like focusing only on the fingers, without ever acknowledging that they all extend outward from the one hand." The differences between the fingers matter, of course: the thumb can do things that the baby finger can't do. But who could ever understand what it is to be a finger without perceiving the hand that holds them all together?

We who are brothers and sisters in the Abrahamic family — Muslims, Jews, and Christians — have not found it easy to acknowledge that we all worship the one God. We acknowledge the distinctiveness of God's prophets,

and we are right to do so; but we are less good at testifying to the one God who sends prophets to humankind. In a divided world, a world that stands poised on the brink of war and environmental catastrophe, it becomes urgent that we learn to emphasize what unites us all as children of Abraham.

In these few pages I would like to focus on science as an important but underutilized resource to help Muslims, Jews, and Christians recognize what we share in common. This suggestion may strike some readers as a surprising resource for addressing the problem. After all, doesn't science often line up as an opponent to religion? Is

it not itself a divisive force? But these responses overlook some important features of the religion-and-science discussion. In fact, there are at least five significant ways in which science can be helpful to the interfaith dialogue:

- The common respect that scientists share for each other's work can help them learn to respect each other's religion just as deeply.
- The very differences of the sciences from religion serve to draw the religions closer together.
- Even the similarities between science and religion deepen our sense of the common threads that bind us together.
- Science appears most noble when seen in the light of religion, and religion can perceive its essence most clearly when it is viewed in the light of science.
- The study of the natural world and the study of God's revelation through his prophets offer two forms of knowledge of the one ultimate reality. When we see both as means to divine understanding, we better understand the nature of religion.

I.

We'll return to each of these themes in what follows. Let me begin, however, with a story. The visionary founder of the Templeton Foundation, Sir John Templeton,

had learned this lesson by the early 1990s. He commissioned the Center for Theology and the Natural Sciences in Berkeley, California, led by Robert J. Russell, to bring together Muslim, Jewish, and Christian scientists for intense, private discussions. The project, which ultimately lasted seven years, came to be known as "Science and the Spiritual Quest" (SSQ). SSQ convened groups of 15 scientists each, divided by specialization: cosmology, physics, biology, etc. Each of us knew our individual faith, and all of us knew science, but at the beginning we were ignorant of each other's traditions. Unfortunately, ignorance breeds prejudice. We also gradually realized that our religious leaders — our priests, rabbis, and imams — had taught us things that increased our suspicion of each other.

What to do? We did what we knew how to do: we talked about science. Biologists shared their love of nature; doctors shared their passion for healing sickness; physicists discussed the enduring puzzles of their fields; cosmologists talked about the newest data from astronomy. We learned to respect each other as scientists. When the trust was in place, we began to share our personal stories about our religious communities, our scriptures, our understanding

of God, and our attempts to live faithful lives in continuous response to God. Amazing things happened during each of the three-day periods when we met for intense discussion and exploration.

In June 1998 the Physics Department at the Berkeley campus of the University of California invited 23 of the SSQ scientists to publicly share the results of their meetings. Six hundred guests packed the Wheeler Auditorium on the center of campus, and media from around the world were present. As, one by one, the scientists came to the podium to speak, a surprising pattern began to emerge. They began setting aside their carefully prepared notes and speaking to the audience from the heart. Their common message went something like this: "The religious teachers of my tradition have too often focused on what separates Jews from Muslims and Muslims from Christians. But for the first time in my life I have found that there is more that binds us as believers in God than separates us. If we had begun with theology, I don't think we would ever have learned this. But because of the high regard in which we hold each other as fellow scientists, and because of the common ground that we share as students of the natural world, we have come to see our commonalities for the first

time."

It wasn't just the scientists who realized that something special was happening; the audience and the media realized it as well. *Newsweek Magazine* featured the conference as its cover story in July 1998, and within a few months the event had received 100 million media impressions. In an age when religious divisions attract so much attention, people are more and more eager to hear about occasions when religious people become allies and partners. When science helps believers to bury old prejudices, the international interest is even stronger.

II.

Some years have passed since this early Templeton project, and by now many scientists and religious believers around the world have had similar experiences. Can science still have this positive effect? What must we do to make it possible? Most importantly, how can we construct the interfaith dialogue today so as to maximize this powerful sense of connection between Muslims, Jews, and Christians? To answer these questions, it's important to return to the five propositions with which I began and to consider each one in greater detail.

(1) *The common respect that scientists share for each other's*

work can help them learn to respect each other's religion just as deeply. This is the most direct moral of the "Science and the Spiritual Quest" story. Respect is the only starting point. When a person or tradition is very different from your own, you have to overcome the natural tendency to see that tradition, or that person, as inferior. For example, the people of European descent in North America have had a very hard time treating the people of African descent as fully equal. Racial prejudice leads to separation, separation leads to discrimination, and discrimination leads to injustice. Yet the antidote really isn't that complex: as soon as whites begin to engage in activities together with blacks, they realize that their prejudices are unfounded. Inevitably they learn mutual respect through working together, or studying together, or playing sports together, or attending the same religious community.

The same principle applies to religious difference. Science is a demanding taskmaster. No person masters medicine, engineering, mathematics, or physics without both intelligence and hard work. When you have undergone the rigorous work of mastering a scientific discipline, it becomes easy for you to respect others who have achieved a mastery

in your field that is equal to or greater than your own. And once you have begun to look another human being in the eye with deep respect, it is much less difficult to learn to respect his religious beliefs and practices as well — no matter how different from your own they may be.

(2) *The very differences of the sciences from religion serve to draw the religions closer together.* It may seem like Doha is a long way from Los Angeles, especially when one is suffering through jetlag before or after the long flight between these two cities. But when we consider the distance between them as a fraction of the distance to a nearby star — say, Alpha Centauri — the distance pales in comparison. Alpha Centauri is the closest star to our solar system, but it is still 4.37 light years away. That's a staggering 4.134×10^{13} km. Imagine the jetlag you'd have after that trip! Similarly, one horse may look quite different from another one, but when you compare the two horses to a turtle, they don't seem so different after all.

Comparing Islam, Judaism, and Christianity to science has the same effect. To recognize how different the core scientific practices are from all three of our religious traditions is to recognize at the same time how many

religious practices we all share in common: prayer, scripture reading, fasting, almsgiving, and above all to worship the name of God, the compassionate, the merciful.

Scientific work does not employ any of these means. What makes science powerful in its particular domains are objective data and replicable experiments. No one knows for sure what happens in the heart of another person, and two people's experience of the same conversation can be miles apart. By contrast, the data-points upon which we build our best theories are the result of objective measurements and carefully corroborated data collection. The experimental procedures by which we test a given scientific prediction must be set up in a way that any scientist in the world can, in principle, repeat the same experiment. It can't matter whether the scientist is Chinese or Arab, Indian or European, black or white, male or female, believer or nonbeliever. Of course, this demand means that certain important areas of human experience lie outside of the realm of scientific experiment; the domain of natural science is narrower than the domain of human experience as a whole. In fact, the incredible power of the scientific method for understanding physical states of affairs comes precisely from this

limiting of the questions that can have scientific answers.

No one equates the practices of science and the practices of religion. As we better understand their differences, we cannot help but understand at the same time how much Muslims and Jews and Christians share in common.

(3) *Even the similarities between science and religion deepen our sense of the common threads that bind us together.* Science and religion cannot be identified. But of course they are not utterly dissimilar either. To reflect on their common features is at the same time to learn more of what the three Abrahamic faiths share in common.

One way to perceive the similarities is to think in terms of three levels. The first level is experience. Religious persons know about the immediate sense of the world as created by God. We know the feeling of gratitude that wells up automatically within us in response to divine compassion and care. We know the sense of the immensity of the universe, through which we intuit the divine power that undergirds all things. Scientists also begin with a basic level of experience of the world. Some scientists have spoken of the "natural piety" that leads them to value the basic data of experience, even when it overturns cherished

hypotheses. Both groups, in their different ways, value this primary level of immediate experience, which serves as a foundation for all that follows.

The second level is belief. Every Muslim interprets his or her experience in light of the teachings of God's Prophet (saas) in Holy Qur'an. Every observant Jew finds himself or herself reflected and involved in the central narratives of Torah. These are not just stories of a bygone era; they are the defining narratives of Jewish identity. And Christians relive the progression from Christmas to Easter afresh in each liturgical year. To be a Christian just is to see the world in light of the teachings of Prophet Jesu.

Science is not different; it too offers core beliefs that form one's identity as a scientist. The physics of Galileo and Newton and Maxwell's equations is not universally valid, as physicists once believed. But we still understand these sets of equations as "limit cases" of a more generalized physics. Today special and general relativity, the Schrödinger equation and quantum field theory, inflationary big bang cosmology and the four fundamental forces of nature provide the central framework with which physicists view the world. Now it usually makes scientists uncomfortable to describe these

theories as a "belief system." Still, it is certainly true that new observations in physics are and must be interpreted in light of the dominant physical theories of our time. This fact represents a parallel between science and religion that is too seldom appreciated.

The third level is reflection. Members of religious traditions, and especially scholars, are just as driven to understand their worldview in a systematic way as scientists are. The widespread assumption that religious believers are simplistic, that their belief systems lack deep reflection, and that they cannot comprehend the demands of systematic and rigorous thought is not just insulting; it is so far from the truth that it is ludicrous. For example, for several decades I have worked to understand the great centuries of classic Islamic philosophy. Hundreds, if not thousands, of books have been written about the profound philosophical reflection that we find in the works of Al-Farabi, Ibn Sina, Ibn Rushd, and of course al-Ghazālī. No less complex are the Scholastic Christian thinkers who came after, and were inspired by, these great Islamic philosophers and theologians. Ordinary believers do not *need* to know the philosophers, and God's prophets are not reliant on them. Still, they are a living testimony

that human thought is not any less profound when directed toward the question of God than it is when directed toward the law-like regularities of the natural world which science studies.

(4) *Science appears most noble when seen in the light of religion, and religion can perceive its essence most clearly when it is viewed in the light of science.* Perhaps it will be seen as controversial to claim that, just as science needs religion for its fullest self-understanding, so also religion has something to learn from the human quest for knowledge that we call science. In making this claim, I merely reflect the brilliant insight that Albert Einstein had when he made his famous statement, "Science without religion is lame, religion without science is blind." Or, as another religious teacher put it,

Science and religion are the two wings of one bird. Both must be equally strong for the bird to fly: "Religion and science are the two wings upon which man's intelligence can soar into the heights, with which the human soul can progress. It is not possible to fly with one wing alone!"¹

One certainly finds interpretations of the scientific project in the history of science that are less than noble. Some philosophers of science have said that science exists merely to

"save the appearances," that is, to find patterns in the data, but without making any truth claims. The positivists limited science to observation statements without broader theoretical validity, and some contemporary philosophers of science deny that any scientific theory should be interpreted in a realistic fashion. But it's interesting that the interpretations of science that really inspire us are those which claim for science a status and comprehensiveness that is similar to the comprehensive worldviews that theologians have defended.

On the other hand, religious thinkers have something to learn from science as well. Without the inspiration of science, it is too easy to see the pronouncements of our religious leaders as merely political statements, defending a particular group within a religion as right while castigating all other groups within that religion as wrong. Religious thinkers have sometimes seemed more inspired to crush rival positions within their own religious tradition than to struggle, however humbly, to say something helpful about the nature of the eternal God. At least in the Christian tradition, the most noble forms of reflection have been those that have turned their eyes beyond the provincial theological battles raging at a

particular time and that seek to achieve some knowledge (*gnōsis*, *scientia*, *Wissenschaft*) of God and God's revelation. Interestingly, each of these three italicized terms described a more general quest for knowledge that could also be called "science."

(5) *The study of the natural world and the study of God's revelation through his prophets offer two forms of knowledge of the one ultimate reality. When we see both as means to divine understanding, we better understand the nature of religion.* In a sense, this statement is the natural extension of the previous point. Holy Qur'an teaches that the quest for knowledge is something that everyone should pursue. But knowledge requires us to use the best of the rational faculties that God has given us: "And He has subjected to you (man), from Him, all that is in the heavens and on earth: behold, in that are signs indeed for those who reflect." (45:13). Clearly, the Prophet expects from us the work of reflection.

In the West, Galileo Galilei became famous for distinguishing between the Book of Nature and the Book of Scripture. He spoke of science as natural philosophy:

[Natural] philosophy is written in that great book which ever lies before our eyes — I mean the universe — but we cannot

understand it if we do not first learn the language and grasp the symbols, in which it is written. This book is written in the mathematical language, and the symbols are triangles, circles and other geometrical figures, without whose help it is impossible to comprehend a single word of it; without which one wanders in vain through a dark labyrinth.²

But God has also made the divine nature and divine will known through a second book, the Book of Revelation. Both books offer knowledge of truth, but they offer this knowledge in different forms, through different sources, in different languages, and for different purposes. Sometimes it takes the scientific quest for knowledge to remind religious believers that we are expected to reflect, to work for knowledge, not only in everyday life but also in the realm of our religious belief and practice. As the New Testament puts it, "My brethren, do not be children in your intellects, but be infants in evil and be fully mature in your intellects" (1 Cor. 14:20, Aramaic Bible in Plain English).

III.

As very young children, we knew one family, one culture, and one religion. Soon we encountered other families and formed

friendships with children not genetically related to us. Then we encountered multiple cultures, with their startlingly different ways of organizing the world and living within it. At some point, we began to have close encounters with members of other religious traditions. Those of us fortunate enough to engage in constructive interfaith dialogue have found deep friendships among the rich and diverse children of Abraham.

Interfaith dialogue does not undercut one's own belief and practice; it intensifies it. My argument in these few pages is that science can do the same. Just as we once saw members of other religions as threats and only gradually discovered that they could be our allies, so also it is with

science. What once seemed like a threatening and "secular" way to study the world can gradually become an opportunity for us to deepen our knowledge and grow in our faith. The five points that we have explored here are means to that end.

Of course there are dangers; one must not portray the dialogue with science as always easy and friendly. But it is equally misleading to paint the dialogue as always dangerous and destructive. Believers have much to learn from science, this other great means of acquiring knowledge. Science and religion are indeed two wings which, working together, can lift the human spirit above the trivialities of everyday life and point it again to its ultimate Origin.

Notes

¹ `Abdu'l-Bahá, *Paris Talks*, p. 143, quoted recently in the *Huffington Post* by Stephen R. Friberg; see http://www.huffingtonpost.com/stephen-r-friberg/science-religion-and-the-bahai-faith_b_1598473.html, accessed June 2, 2013.

² Galileo, 1623 [1661], *The Assayer*, Thomas Salusbury (trans.) p. 178; quoted in Edwin Arthur Burtt, 1964, *The Metaphysical Foundations of Modern Physical Science*, London: Routledge & Kegan Paul.



Pilgrim in a Rocky Valley: Carl Gustav Carus

Illumination without Knowledge: Michel de Certeau's *The Mystic Fable*

By Philip Sheldrake

For some mainstream religious believers and religious authorities, “mysticism” evokes a notion of the dangerous promotion of esoteric knowledge, based on claims by certain individuals to a privileged experience of God that seems to bypass doctrine and law. However, on the contrary, Christian mystical writers precisely question whether

an ultimately mysterious God may be “known” or defined. Thus, the great medieval German mystical theologian, Meister Eckhart, loved to cite St Augustine on speech about God. “If I have spoken of it, I have not spoken for it is ineffable” (Augustine, *Christian Doctrine*, 1.6). Eckhart also emphasised in his sermons that

the ultimately unknowable God is ultimately beyond all philosophical and theological categories. Other mystical writings contrasted knowledge with love. For example, the anonymous fourteenth-century English monk who wrote the popular mystical text, *The Cloud of Unknowing*, suggested that there was a “cloud of unknowing” or darkness between us and God. We may only reach God by “a dart [arrow] of longing love” but not by thought.¹

In this context, the writings on mysticism by the French Catholic priest and Jesuit, Michel de Certeau (1925-1986) are especially relevant and challenging. De Certeau was one of the most creative interdisciplinary thinkers of the late twentieth century as well as a highly original writer in reference to Christian mysticism. At the same time, de Certeau is particularly difficult to summarise or to interpret definitively. To begin with, he approached every subject from a transdisciplinary standpoint, drawing extensively upon history, theology, spirituality, cultural theory, politics, philosophy, psychoanalysis and the social sciences. However, in addition, de Certeau’s writings – and not merely those concerning mysticism – also deliberately resist any attempt at systematisation.

De Certeau’s deliberately enigmatic style was based on his underlying approach to epistemology – that is, to the nature of knowledge, its scope and its origins. Overall, de Certeau rejected what he saw as the dangers of philosophical fundamentalism that he detected in some aspects of European post-Enlightenment thought, notably a tendency towards rationalist positivism. Thus de Certeau questioned both the extent to which anything can really be fully known and also whether “knowledge” is reducible merely to a mental capacity to think logically or to make rational deductions about reality. Clearly this standpoint is particularly relevant to the question of whether, to what extent and how an ultimately mysterious God may be “known” or defined and plays a central role in his late, unfinished work on Christian mysticism, *The Mystic Fable*.²

That said, de Certeau’s additional emphasis on mysticism as a form of subversive social as well as religious “otherness”, rather than merely a retreat into interiority, also sought to counter the power of dominant cultural, political or religious narratives. Such an attitude had already played a role in de Certeau’s scholarly approach to historical theory. For example, his 1975

work *The Writing of History* and his 1985 essay collection *Heterologies* challenged conventional approaches to historical study and its temptation to present itself as a form of dogmatic realism rather than acknowledging its proper limits as the product of the social, cultural and political assumptions and the context of the historian.³

Interiority and Desire

Michel de Certeau's trans-disciplinarity is readily apparent in his study of mysticism. His interest focussed predominantly on sixteenth and seventeenth century Spanish and French mystical writings and on his perception that the period saw a growing preoccupation with subjectivity and the experiential. This emphasis related to de Certeau's own fascination with modern psychoanalysis. However, de Certeau's understanding of the meaning and role of "mysticism" cannot be reduced to mere interiority or individual experience. He wrote in the context of a late-Modern western culture that had lost faith in the bedrock of an autonomous, clearly defined human subject – whether grounded in a notion of "the soul" or in Descartes' individual "mind". At the same time, de Certeau's interest in mysticism as a social *practice* rather than simply

subjective experiences brought him close to the emphasis on Christian mysticism as a way of life present in the writings of Bernard McGinn.⁴

For de Certeau, mysticism was above all bound up with spiritual desire. "Desire" is a key concept in his writings – one that he shared with such French postmodern philosophers as Michel Foucault and Jacques Derrida. However, the focus on "desire" also summarises the heart of the Christian spiritual tradition (Ignatius of Loyola's *Spiritual Exercises*) to which de Certeau was personally indebted. For both the mystic and the postmodern person, "desire" expresses a persistent drivenness, intensity and restless movement onwards inspired by what is *not* known, *not* possessed and never definitively reached. In religious terms, this ultimate horizon is God.

They [the mystics] are, she said [Hadewijch, the thirteenth-century mystical writer], "drunk with what they have not drunk": inebriation without drinking, inspiration from one knows not where, illumination without knowledge. They are drunk with what they do not possess. Drunk with desire. Therefore, they may all bear the name given to the work of Angelus Silesius: *Wandersmann*, the "wanderer".⁵

Although de Certeau knew that the genre of Christian mystical writing began to emerge in the thirteenth century, in his researches on “mysticism” as a recognisable category in Christian writing (or “mystics”, from the French, *la mystique*) he established that the key point in its formalisation was between the mid-sixteenth century and the mid-seventeenth century and particularly in early seventeenth century France.⁶ This paradigmatic period of mysticism proliferated in the context of what de Certeau refers to as “a loss”. The various movements and writings were born (to use de Certeau’s words) “with the setting sun”. This referred to the gradual demise of the previously culturally dominant Christian worldview.⁷ De Certeau asserted that the “dark nights” expressed in various sixteenth and seventeenth century mystical texts refer not merely to subjective states of spiritual loss but also to the overall situation of religious institutions and ways of thought in Western culture.⁸

Mysticism as Subversion

For de Certeau, the classic sixteenth and seventeenth century mystical texts that he studied did not attempt to replace the ailing system of intellectual theology with new frameworks of knowledge or alternative contexts of power.

Rather, mysticism subverted this entire way of thinking and pointed towards a quite different approach to Christian religion. De Certeau underlined that Christianity was not founded to be an institution or a body of doctrines but as a way of life. De Certeau’s approach portrayed Christianity as a journey towards the mystery of God. Precisely because mystical language tentatively engages with the Absolute (God), it can only speak about this by, in de Certeau’s words, “erasing itself”.⁹ Because the object of mystical writing, God, is infinite, such writing is “never anything but the unstable metaphor for what is inaccessible”. So, for de Certeau, the study of mysticism “only assembles and orders its practices in the name of something that it cannot make into an object (unless it is a mystical one)”.¹⁰

For de Certeau, the subversive quality of mysticism is represented by the theme of perpetual departure. For him, there was a close relationship between the post-Enlightenment (or Modernist) emphasis on objective rational knowledge and issues of power. Thus Michel de Certeau suggested that people whose lives spoke of the “otherness” of an essentially mysterious God were outsiders to this Modernist project.

Unbeknownst even to some of its promoters, the creation of mental constructs...takes the place of attention to the advent of the Unpredictable. That is why the "true" mystics are particularly suspicious and critical of what passes for "presence". They defend the inaccessibility they confront.¹¹

As early as the thirteenth century, that is, since the time when theology became professionalised, spirituals and mystics took up the challenge of the spoken word. In doing so, they were displaced toward the area of "the fable"..... Everywhere they insinuate an "extraordinary": they are voices.....grown more and more separate from the field of meaning that writing had conquered, ever closer to the song or the cry.¹²

De Certeau's interest in sixteenth and seventeenth century mysticism arose from the parallels he perceived between this period and his own times when the religious word could no longer be effectively proclaimed in the old ways. The world was increasingly seen as opaque and unreadable. In response to this spiritual disenchantment the people we refer to as mystics sought to speak a different kind of language. As de Certeau himself says, this mystical language "is only the

story of a journey" that ultimately defies conclusive investigation. In his somewhat opaque words, the language of mysticism "overpowers the inquiry with something resembling a laugh".¹³ Mystic literature offers "a way not to come back" to whoever "asks directions to get lost".¹⁴

The various strains of *mystics*, in their reaction to the vanishing of truths, the increasing opaqueness of the authorities and divided or diseased institutions, define not so much a complementary or substitutive knowledge, topography, or entity, but rather a different treatment of the Christian tradition.... they institute a 'style' that articulates itself into *practices* defining a *modus loquendi* and/or a *modus agendi*...What is essential, therefore, is not a body of doctrines (which is the effect of these practices and above all the product of later theological interpretation), but the foundation of a field in which specific procedures will be developed...¹⁵

Mysticism and Social 'Practice'

At first sight, the writings of de Certeau concerning mysticism appear to make it not only marginal but also privatised. In

early modern Europe, “a prophetic faith organised itself into a minority within the secularised state”.¹⁶ Any ambition by the Church after the sixteenth century to, in de Certeau’s words, “reconstitute a political and spiritual ‘world’ of grace” was ultimately doomed to failure. However, while de Certeau describes the relocation of mystic groups to the cultural and theological margins, his understanding of mysticism is that it is always a social reality rather than a purely interiorised one. In fact de Certeau differs from many other twentieth century commentators on mysticism in *not* stressing individual “mystical experiences”. For him, mysticism is inherently engaged with the public world. Indeed, one of de Certeau’s central and most controversial views was that Christian mysticism is fundamentally radical and disruptive, both religiously and socially.¹⁷

While the dominant context of mystical literature in this period should not be oversimplified, Michel de Certeau suggested that there were “privileged places” for the development of mystical insight and practice not least within certain social groups. He noted that mysticism seemed to be closely related to forms of instability or social disinheritance.

Thus mystics tended to appear in the:

social categories which were in socio-economic recession, disadvantaged by change, marginalised by progress, or destroyed by war...Aside from a few mystics on the road to social promotion...the majority of them...belonged to social milieux or ‘factions’ in full retreat. Mysticism seems to emerge on beaches uncovered by the receding tide.¹⁸

He noted especially sixteenth-century Spanish mysticism where an unusual proportion of the most significant personalities came from the “excluded” class of what he called “closet Semites” (that is, people of hidden Jewish ancestry). These included Teresa of Avila, Luis de Leon and two central figures in the early Jesuit Order to which de Certeau belonged, Diego Lainez and Juan de Polanco.¹⁹ Later in seventeenth century France, some members of religious and social elites (for example the circle around Cardinal Bérulle) actively sought to associate themselves with the poor, the simple and the illiterate. As de Certeau put it, such spiritual figures left behind their traditional sources of authority in order “to turn to the exegesis of ‘wild’ voices”.²⁰

Mysticism and Christian Practice

We should recall the relationship between de Certeau's interest in mysticism and the way he understood himself to be speaking in a twentieth-century world where classic systems of meaning, including institutional Christianity, were no longer accepted as definitive. For de Certeau, Christian identity had always consisted in a classic tension between following Jesus Christ (discipleship), and a commitment to radical change (conversion). Christians journey onwards with no guaranteed security apart from the story of Jesus Christ that they seek to *live out* rather than to reduce to dogmatic statements.²¹ Christian spirituality and mysticism must avoid the temptation to settle down into a new, definitive location.

The temptation of the "spiritual" is to constitute the act of difference as a site, to transform the conversion into an establishment, to replace the "poem" [of Christ] which states the hyperbole with the strength to make history or to be the truth which takes history's place, or, lastly, as in evangelical transfiguration (a metaphoric movement), to take the "vision" as a "tent" and the word as a new land.

In its countless writings along many different trajectories, Christian spirituality offers a huge inventory of difference, and ceaselessly criticises this trap.....²²

For de Certeau, the primary symbol of Christian practice is now the empty tomb of the risen and departed Jesus.²³ As the Gospel of Matthew (chapter 28, verses 6-7) states, "He is not here; for he has been raised, as he said...indeed he is going ahead of you to Galilee." The risen Jesus is now necessarily elusive. He is always the one who has already gone before us.

Mysticism as a Fable

De Certeau's major book on mysticism is entitled *The Mystic Fable*. Mysticism is a fable in the sense that it subverts the definitive status of dogmatic language. It is a language without obvious power. Yet paradoxically, that is its strength. It calls into question strategically defined, and apparently definitive, systems of meaning. Believers in Christianity are called in this present age to become once again wanderers who are always departing in answer to a call to follow Jesus, without the burden of power, authority or even a secure identity. The Christian community carries the fabled tale of Jesus Christ, which subverts all our fixed

positions, across an alien territory towards the unnameable eternal reality that we call "God". "Faith speaks prophetically of a Presence who is both immediately felt and yet still to come, who cannot be refused without a betrayal of all language, and yet who cannot be immediately grasped and held in terms of any particular language."²⁴

The intellectual assumptions of western Modernity place a powerful emphasis on reason and intelligibility, not least in reference to our language about God. Because of this, De Certeau sees those people whose lives affirm the elusiveness and essential "otherness" of God as outsiders.²⁵ Perhaps this is why de Certeau was fascinated throughout his life by the life and writings of the seventeenth-century mystic and fellow Jesuit Jean-Joseph Surin (whom he called "my guardian"). Surin had profound psychological problems as a result of trying to sort out the supposed demonic possession of a community of nuns in Loudun and was subsequently isolated and marginalized.²⁶

Because the way of "knowing" suggested by mystical writers is based on union with God rather than on the power of the human mind to capture reality, and on moments of illumination rather than on conclusive "knowledge",

their work bears some resemblance to the "subjugated knowledges" addressed by the postmodern French philosopher Michel Foucault. This way of knowing resists the mainstream structures of power and knowledge and opposes established forms of discourse.²⁷

The Never-Ending Quest for 'The Always More'

On the poignant last page of the unfinished *The Mystic Fable*, de Certeau expressed, in a typically enigmatic way, the unavoidable pain of bypassing the security of religious dogmatic language. It seems to me that his epistemological position was of someone who, like the mystical writers he studied, realises that he cannot escape the never-ending journey of the human spirit beyond definable goals or desires that can be named in a simple and clear way. For if a deep spiritual quest remained at the heart of de Certeau's personal quest, the inner logic of his thinking towards the end of his life demanded that the "Other", God, who we continually seek is necessarily beyond our ability to define or control. Thus God can only be spoken about tentatively and in terms of One who is always more than we can conceive.

He or she is a mystic who cannot stop walking and, with the certainty of what is lacking, knows of every place and object that it is *not that*; one cannot stay *there* nor be content with

that. Desire creates an excess. Places are exceeded, passed, lost behind it. It makes one go further, elsewhere. It lives nowhere.²⁸

Notes

¹ See the text of *The Cloud*, Chapter 6, in Anon., *The Cloud of Unknowing and Other Works*, A. C. Spearing (ed.), 2001, London/New York: Penguin Books.

² Michel de Certeau, 1992, *The Mystic Fable*, English translation, Chicago: University of Chicago Press.

³ See Michel de Certeau, 1992, *The Writing of History*, English translation, New York: Columbia University Press; also 1995, *Heterologies: Discourse on the Other*, English translation, Minneapolis: University of Minnesota Press.

⁴ See, Bernard McGinn, 1991, *The Foundations of Mysticism: Origins to the Fifth Century*, New York: Crossroad Publishing, General Introduction, pp. xi-xx.

⁵ De Certeau, *The Mystic Fable*, p. 299.

⁶ Michel de Certeau, 1964, "Mystique" au XVIIIe siècle: Le problème du langage 'mystique' in *L'Homme devant Dieu: Mélanges offerts au Père Henri du Lubac*, Paris: Aubier, vol. 2, pp. 267-91. Also the essay 'Mystic speech' in de Certeau, *Heterologies*, p. 83.

⁷ 'Mystic speech', p. 80.

⁸ 'Mystic speech', p. 81.

⁹ 'Mystic speech', p. 81.

¹⁰ *Mystic Fable*, p. 77.

¹¹ *Mystic Fable*, p. 5 but see the complete Introduction pp. 1-26.

¹² *Mystic Fable*, p. 13.

¹³ *Mystic Fable*, p. 13.

¹⁴ *Mystic Fable*, p. 14.

¹⁵ *Mystic Fable*, p. 14.

¹⁶ *Mystic Fable*, p. 20.

¹⁷ *Mystic Fable*, 'Introduction', pp. 1-26.

¹⁸ De Certeau, 2000, 'Mystic speech', ET in Graham Ward, *The Certeau Reader*, Oxford: Blackwell, p. 191.

¹⁹ *Ibid.*, pp 191-92.

²⁰ See 'Mystic speech', pp. 85-86.

²¹ See 'The Weakness of Believing', *passim*.

²² 'The Weakness of Believing', p. 236.

²³ 'The Weakness of Believing', p. 234.

²⁴ Michel de Certeau, 1966, 'Culture and Spiritual Experience', *Concilium*, 19, pp. 3-16.

²⁵ *Mystic Fable*, especially Introduction, pp. 1-26.

²⁶ See *Mystic Fable*, *passim* but especially chapter 7, 'The Enlightened Illiterate'. De Certeau also edited the work of Surin, 1963, *Jean-Joseph Surin: Correspondence*, Paris: Desclée, and 1963, *Jean-Joseph Surin: Guide Spirituel pour La Perfection*, Paris: Desclée.

²⁷ Michel Foucault, 1980, *Power/Knowledge: Selected Interviews and Other Writings 1972-77*, ET London: Pantheon Books, p. 81.

²⁸ *Mystic Fable*, p. 299.



Lombard in Allagash Wilderness, Maine, USA

Tarkovsky, Science and Faith

By Elizabeth K. Zelensky

Faith and science – two mutually exclusive worlds or two aspects of the same God-given reality? On a recent canoe trip down the Allagash River in Maine I spent some time reflecting on this enigma. My thoughts crystallized at the sight of an iron apparatus eerily embedded in a grove of pine trees, but the origins of my speculations concerning science and faith lay far from the Maine woods, in the spiritual substructures of Russian culture. On that particular July day these thoughts were filtered through images from Russian director Andrei Tarkovsky's film *Stalker*,¹

most probably due to some visual similarities in the setting of canoe trip and film - woods, water, abandoned machinery.² The cultural conventions which made both thoughts and film possible were rooted in a much deeper layer of consciousness - one based on the Eastern Orthodox Christian anthropology of *theosis* or likeness to God.³ The possibilities offered by *theosis* for connecting faith and science prompted the following reflections.

A park ranger from the Allagash Wilderness Waterway had told us about the fabled "Lombards"⁴ – giant track-powered log hauling

engines, the progenitors of today's tanks, tractors, snowmobiles – whose invention in the early twentieth century opened up thousands of acres of maple, beech, birch and ash to the lumber industry. The new-growth forest lining the banks of the Allagash today testifies to their terrible efficiency. Once roads were built and transportation by trucks was financially feasible these monsters became obsolete. Too heavy to move, too cumbersome to destroy, they remain in the northern Maine woods; still and abandoned, brooding. Their image touched our imagination and curiosity quickly morphed into a quest; we had to find them.

Following the ranger's directions we paddled down the swift-flowing river until we came to a bend and a steep bank. Pulling the boats ashore we clambered up the sandy incline. The woods engulfed us immediately in a green chaos of ferns, tree trunks and moss. Pushing on through thick undergrowth, we came to the first Lombard – a locomotive on iron treads which once pulled tons of lumber through trackless forests to the riverbank to be floated downstream to the mills. Now iron rails were intertwined with roots, rivets held cups of moss, wildflowers grew between tractor treads - the very strangeness of this

vision foregrounded the paradox at the heart of all technology; its ephemeral nature, its inability to transcend circumstance, finally its dependence on man. The second monster, a few dozen steps away, had been taken captive by a grove of pines which now stood crowding around its rhinoceros-like bulk. Two tiny wooden houses about six inches tall nestled beside it, adding another layer of mystery. Was this a far-off echo of the Thai custom of honoring local spirits by providing them with a dwelling place, a sign of globalization penetrating these Maine woods? Or were they a reference to something much closer to home - Native American burial rites?⁵ We would never know. However, the two spirit houses silently assured us that we were not alone in appreciating the spiritual reverberations let loose by this juxtaposition of nature and machine; someone else had also responded to the its otherworldly aura. Several members of our group familiar with the film **Stalker** cried out, "That's it! We're in the *Zona*".

Zona in Tarkovsky's **Stalker** is that zone of greenery and water surrounded by the ruins of a decaying post-industrial civilization at whose center stands a room where every heart's desire comes true, for good or ill. This

room is the goal of two of the protagonists Writer and Professor, who brave the terrors of a post-apocalyptic landscape for its sake. At first glance this quest seems imbued with an anti-modernist, anti-scientific coloration.

Before setting out on the journey Writer laments the sterility of the contemporary world - a world ruled by "the iron laws of reason" and contrasts it with the Middle Ages" when each house had its *домовой*/house spirit or pixie and God was in each church." The fact that Professor is secretly carrying a bomb meant to destroy the wish-fulfilling room in the name of rationality and science further strengthens this first impression of **Stalker** as being something of a Luddite⁶ allegory masked in Russian spiritual angst. Tarkovsky himself, in a passage from his book, *Sculpting in Time* could be describing the effects of this room as a figurative stand-in for technology when he says: "Let us imagine people have attained happiness, the absolute state of complete freedom of will in the widest sense - at that moment human personality is destroyed.⁷ Man becomes as solitary as Beelzebub. The connection between social beings is cut like an umbilical cord, ... And consequently society is destroyed." Tarkovsky fears will or

desire set loose by technology and unbridled by anything but rational self-interest. Man is human only within the limits arising from the divine image within as this is projected outward - on the society of other men.

The guide - the eponymous Stalker - is the central character of the film. He shifts the story into something much more profound than a simple anti-modernist fable. Stalker alone believes in the sacred character of the *Zona* - the "awe" fullness of its limitless power, and because of this he never goes into the room himself, though he is willing to risk life and limb out of empathy for others' need to do so. It is this paradoxical reserve on the Stalker's part which transforms the film's narrative into a koan - mysterious and open-ended.

And it is this commitment to open-endedness, to avoiding the determinism of narrative in favor of the barely tangible and indirect patterning of overlapping metaphoric planes which underlies Tarkovsky's understanding of cinema as a whole, not just **Stalker**:" I find poetic links, the logic of poetry extraordinarily pleasing⁸, "Through poetic connections feeling is heightened and the spectator is made more active. He becomes a participant in the process of discovering life, unsupported by readymade

deductions from the plot or ineluctable pointers by the author. The usual logic, that of linear sequentiality, is uncomfortably like the proof of a geometric theorem associative linkage allows for affective as well as rational appraisal. When less than everything has been said about a subject you can still think further. The alternative is for the audience to be presented with a final deduction, for no effort on their part, and this is not what they need. What can it mean to them when they have not shared with the author the misery and joy of bringing an image into being communication always demands exertion. ... and ... the triumph over muteness ... demands unrelieved superhuman effort.”⁹

Tarkovsky’s saturated, long-take style, which relies on the cinema audience as working participants in the act of film creation, was developed in opposition to what is probably the most well-known innovation in Soviet cinema; Eisenstein’s use of montage: “My own method is quite different. Eisenstein’s montage dictum contradicts the very basis of the unique process by which a film affects an audience. It deprives the person watching the screen of the prerogative of film, which has to do with how film’s impact is distinguished from impact of

literature or philosophy: namely, the opportunity to live through what is on the screen as if it were his own life, to take over the experience imprinted in time upon the screen, relating it to his own life. ... Eisenstein makes thought into a despot; it leaves no “air” nothing of that unspoken elusiveness which is perhaps the most captivating quality of all art.”¹⁰

Tarkovsky, far from being a Luddite was convinced that art and technology must both be used to expand human freedom. Every age asks its own unique questions concerning mankind’s place in the universe which in turn elicit the appearance of new forms of science and art. In the twentieth century the central question became that of time; the dearth of time, the ever-more rapid passage of subjective time and its consequences for man’s perception of self and world. “Rather over eighty years ago the point was reached when a new muse had to emerge. Cinema was the first art form to come into being as a result of a technological innovation, in answer to a vital need. It was the instrument which humanity had to have in order to increase its mastery over the real world ... As he buys his ticket, it’s as if the cinema-goer were seeking to make up for the gaps in his own

experience, throwing himself into a search for 'lost time.' In other words, he seeks to fill that spiritual vacuum which has formed as a result of the specific conditions of his modern existence; constant activity, curtailment of human contact, and the materialistic bent of modern education." "I think what a person normally goes to the cinema for is time: for time lost or spent or not yet had. He goes for the living experience: for cinema, like no other art, widens, enhances and concentrates a person's experience - and not only enhances it but makes it longer, significantly longer. That is the power of cinema; 'stars', story-lines and entertainment have nothing to do with it."¹¹

If time is the medium then faith is the moving force in the plot of *Stalker*: The room of fulfilled desires remains inaccessible for both Writer and Professor because, as Stalker says, "they lack faith in their own intentions". Their inability to believe imprisons them in 'the 'wasteland' of modern life' – T.S. Eliot was a major influence on Tarkovsky. At the end of the film, in defeat, Writer, Professor and Stalker leave the green zone and return to the black and white world of post-industrial decay and incapacity. The actual set for this film was an abandoned electric station near Tallinn, Estonia.

Screened in 1979, the film's impact deepened after 1986 once the Chernobyl tragedy gave a grim credence to the existence of a post-apocalyptic zone in the USSR.

Here it is important to note that the role of faith in the Russian cultural system has a strong voluntaristic dimension: thus lack of faith on the Writer's part may also be understood as a lack of the will to believe. Faith arises in the Eastern Orthodox perspective as a synergy between God's grace and human will and thus in its essence it is a free and creative act. Rooted in love, this creativity arises from the essentially God-given freedom underlying man's tie to God, and thus it allows participation in God's creative manifestations or Divine Energies here on earth. When Jesus ascended Mount Tabor and revealed himself in his Divine Glory to his disciples (Mathew 17:1-9, Mark 9:2-8, Luke 9:28-36), how were Peter, James and John able to see him? How could creatures participate in the Uncreated Light radiating from Christ in his Divine Aspect? The different responses elicited by this epistemological conundrum in the Western and Eastern Churches further clarify the centrality of will to the concept of *theosis* for the Christian East. Catholic thinkers following St. Thomas Aquinas

posited that all the laws of nature were transformed for the instant of Christ's appearance as God on Mount Tabor, thus the disciples could see the Divine Light as the result of an exterior, supernatural intervention - a miracle. Saint Maximus the Confessor in the seventh century C.E. proposed what remains the Eastern Church's interpretation of the event; the senses of the disciples were transfigured as the result of their desire to participate in Christ's Glory, thus through their *theosis*; they could participate in Christ's Divine Energies through interior changes within their souls. Building on this theme by the end of the thirteenth century the concept of "transfiguration of the believer" had stabilized and Gregory Palamas considered "true knowledge of God" to be a transfiguration of man through synergy with the Spirit of God. Thus, the strict division between object and subject, the impenetrable wall between the mind and the world, matter and spirit characteristic of mainstream modern Western thought from the time of the Enlightenment remains much less distinct and much more permeable in the Eastern Christian world view down to the present.

Tarkovsky, himself a practicing Russian Orthodox Christian, in an interview expressed the same

thought: "The only thing we really have is faith. Voltaire once said, "If God did not exist, it would be necessary to invent him", not simply because he was an unbeliever, though he was that. That wasn't the reason. Materialists and positivists completely misinterpreted his words. Faith is man's sole salvation. This is my most fundamental conviction. Otherwise, what could we achieve? This alone can indubitably be said to belong to man. Nothing else matters."¹² Tarkovsky explains the connection between faith and creativity in the following way: "The absolute is only attainable through faith and the creative act ... If cold positivistic scientific cognition of the world is like the ascent of an unending staircase, its artistic counterpart suggests an endless system of spheres each one perfect and contained within itself. One may complement or contradict another, but in no way can they cancel each other out, on the contrary they enrich each other, and accumulate to form an all-embracing sphere that grows out into infinity. These poetic revelations, each one valid and eternal are evidence of man's capacity to recognize in whose image and likeness he is made and to voice this recognition."¹³ Thus, for Tarkovsky faith is the wellspring of both creativity and cognition.

This spiritually infused attitude towards the technology and science of cinematography is characteristic of what might be called the Russian spiritualization of matter in general, its tilt towards immanence on the path to transcendence. Russian theologian and philosopher Pavel Florenskii expresses this dependence of the spiritual on the material as "the beneficial pull of the earth, which, as it limits us, also gives us a point of support ... it sets up the limits of our fate, and through these limits provides us with the God-like opportunity to practice creativity and free will,"¹⁴ Tony McKibbin, cinema critic, makes a similar point specifically concerning Tarkovsky: "So often we see Tarkovsky's characters hugging the earth as opposed to appealing to the heavens: trust in the immediate reality of one's environment over abstract notions of spirituality would appear to be Tarkovsky's maxim."¹⁵

An interesting question, though one beyond the scope of this brief sketch, might go as follows: Could a view of the world predicated on the anthropological premises of *theosis* have affected the Russian attitudes towards science? L. Graham and J-M .Kantor answer in the affirmative, focusing on a specific aspect of pre-revolutionary Russian religiosity - the so-called

Name Heresy - in *Naming Infinity. The True Story of Religious Mysticism and Mathematical Creativity*. In this book about the French and Russian mathematical rivalry in the field of set theory the authors surmise that the ultimate success of Russian mathematicians in defining set theory through the acknowledgement of multiple infinities - a counterintuitive and even non-expressible thought in the world of late-nineteenth-century mathematics - might have been due to the fact that when their French colleagues had "came to an intellectual abyss influenced by the rationalistic culture in which they lived, they lost their nerve", while the Russians, "invigorated by their mystical belief ... managed to make their way across the abyss. In the different reactions of the French and the Russians to set theory, the impact of their distinct cultural and religious traditions became very evident".¹⁶ Dimitrii Mendeleev - the Russian chemist to whom the final form of the Periodic Table appeared in a dream, and who left blank spaces for elements not yet discovered but in whose existence he believed is another example of the complementary workings of intellect and faith. Progress is often thwarted by the problem of modeling - new concepts are difficult if not impossible

to express through limited old definitions and our human desire for continuity must constantly be appeased. Russian scientists functioned within a semiotic system in which “meaning” was understood in a much more voluntaristic, subjective fashion than in the West. The notion of the divine origins of creativity and will loosened the shackles of rationalistic Cartesianism, and provided intellectual leeway to explore new directions in science. New beginnings inevitably require a leap of faith, which is, finally, humanity’s most profound demonstration of freedom: “In the Beginning was the Word”.

Time, the medium of our mortality also provides the means through which faith can be expressed and thus becomes the means of our transcendence. Andrei Tarkovsky in his films attempts to convey this truth by capturing the poetry of time’s passage on celluloid in its purest form, barely veiled by the trappings of conventional plot. In the director’s own words “Masterpieces stand on mans’ path like ciphers of catastrophe announcing “Danger”.¹⁷ **Stalker** is one such cipher drawing our attention to our alienation from time and from each other through lack of time, a situation even more

evident now in 2013 than at the time of Tarkovsky’s death in 1986.

And so, as we stood in the green Maine woods on that cloudy afternoon we ourselves pondered the mysteries of time’s passage, of creativity and the human will. The Lombards covered in vegetation, sinking into the forest floor, were not simply illustrations of the triumph of nature over the flotsam and jetsam of the age of industrialization. The dead and abandoned machinery was coming alive in our presence- affecting our imaginations - forging a new chain of images through which we glimpsed the fragility and poignant beauty of human endeavor, the tragic necessity behind our desecration of nature, and of our own mortality. Their brooding hulks brought us a bit closer to ourselves for “time is a state; the flame in which there lives the salamander of the human soul”.¹⁸



Notes

¹ See Nariman Skakov, 2012, 'Revelations of *Stalker*' in *The Cinema of Tarkovsky: Labyrinths of Time and Space* London: Idris, and Geoff Dyers, 2012, *Zona: [a book about a film about a journey to a room]*, New York: Pantheon Books.

² <http://www.lacan.com/zizekthing.htm>, Slavoj Zizek, 1999, 'The Thing from Outer Space' *Mainview*, "If *Stalker* is Tarkovsky's masterpiece, it is above all because of the direct physical impact of its texture: the physical background (what T.S.Eliot would have called the objective correlative) to its metaphysical quest, the landscape of the Zone, is a post-industrial wasteland with wild vegetation growing over abandoned factories, concrete tunnels and railroads full of stale water, and wild overgrowth in which stray cats and dogs wander The ultimate Tarkovskian landscape is that of a humid nature, river or pool close to some forest, full of the debris of human artifices (old concrete blocks or pieces of rotten metal).

³ Theosis is defined by Jean Meyendorff in the following way: "The central theme or intuition of Byzantine theology is that man's nature is not a static, "closed," autonomous entity, but a dynamic reality ... determined in its very existence by its relationship to God ... man, created in the image of God, is called to achieve freely a divine "similitude" ... [through, EKZ] a free effort of love. The dynamism of Byzantine anthropology can be easily contrasted with the static categories of "nature" and "Grace" which dominate post-Augustine Western Christianity." J. Meyendorff, 1979, *Byzantine Theology, Historical Trends and Doctrinal Themes*, Fordham University Press: New York, p. 2.

⁴ See 2004, "The Lombard Log Hauler. A National Historic Engineering Landmark" A Background Paper for the Allagash Wilderness Waterway, Maine Department of Conservation, Bureau of Lands and Parks.

⁵ See M. Guelden, 1995, *Thailand: Into the Spirit World*, Singapore: Times Edkins, pp. 83-85; M.Yalom, 2008, *The American Resting Place: 400 Years of History through Our Cemeteries and Burial Grounds*, New York: Houghton Mifflin, p. 8.

⁶ The Luddite Movement was a violent anti-industrialization artisans' revolt in early nineteenth-century Britain. See Eric Hobsbawn, 1952, 'The Machine Breakers', *Past and Present*, 1, pp. 57-90.

⁷ Andrei Tarkovsky, 2012, *Sculpting in Time. Reflections on the Cinema*, Austin: University of Texas Press, (trans.) Kitty Hunter Blair, p. 53.

⁸ *Sculpting in Time*, p. 18.

⁹ *Ibid.*, p. 20.

¹⁰ *Ibid.*, p. 183.

¹¹ *Ibid.*, p. 82, p. 63.

¹² J.Gianvito (ed.), 2006, *Andrei Tarkovsky: Interviews*, University of Mississippi Press, p. 186.

¹³ Tarkovsky, *Sculpting*, p.39

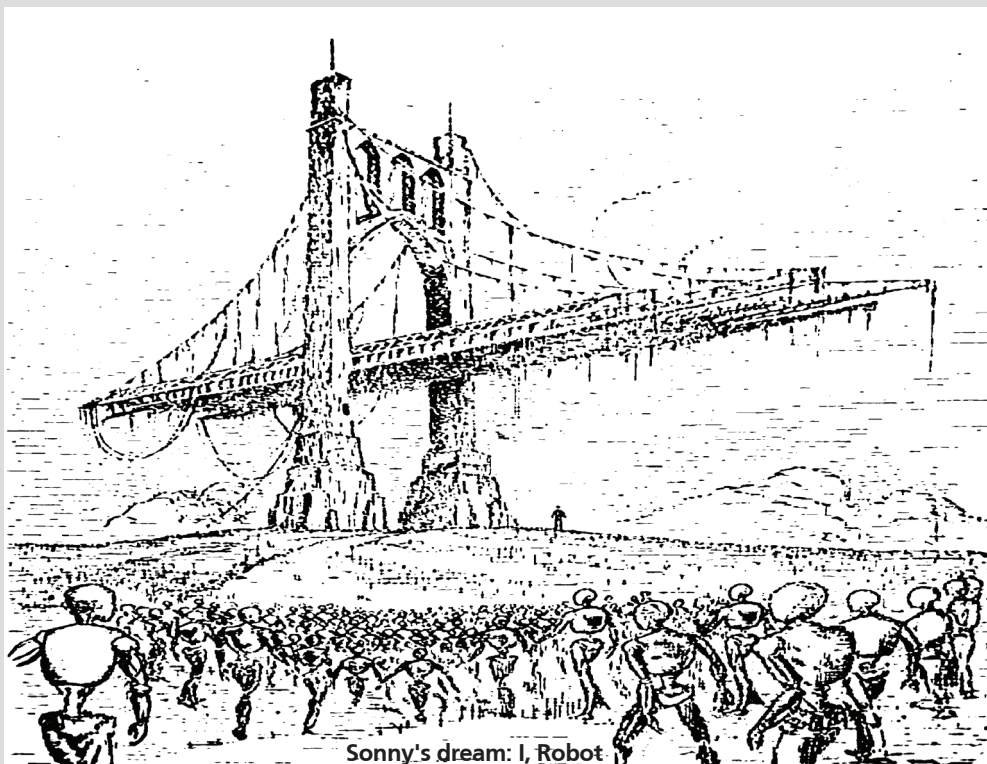
¹⁴ Павел Флоренский, 2010, *Иконостас*, Санкт Питербург: Азбука Классика, p. 22.

¹⁵ Tony McKibbin, 'The Sacrifice-Spiritual Corporeality' tonymckibbin.com/film/the-sacrifice.

¹⁶ L.Graham and J-P. Kantor, 2009, *Naming Infinity. A True Story of Religious Mysticism and Mathematical Creativity*, Cambridge Mass., London, England: The Belknap Press of Harvard University, pp.32-33.

¹⁷ Tarkovsky, *Sculpting*, p. 53.

¹⁸ *Ibid.*, p. 57.



A Theological Response for Ray Kurzweil's Future Perfect¹

By Ashley John Moyse

We live in an age where “vast areas of life once subject to natural necessity or fate [are] now susceptible to human intervention.”² Expressions of human creativity in the form of technological achievements have astonished and amazed—consistently interrupting the experience and expression of reality. At times, the sheer power of human creativity has overwhelmed. Yet many are gripped by the novelty of technological progress and the emergence of

curious techniques, while continuing to remain confounded about where, or what, the boundaries are. Nevertheless, for these many, the possibility of repairing human frailty, annulling certain pathology, and overcoming the limitations of human existence is no longer an improbable fiction, but rather an imminent prospect and tangible possibility.

Along with these many, I too find myself gripped by the novel technologies that have emerged

and am curious about those yet to be developed. However, I am wary that the progressive march toward a future much different from the past has not been well-considered by theologians, religious scholars, clergy, and the like. I, therefore, intend to think about the implications of Christian theology for the fast approaching future Kurzweil has identified as *the singularity*. Therefore, garnering insight and instruction from Bonhoeffer, I will consider this “future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed.”³ With Bonhoeffer, the pending singularity may be thought of as a boundary event, where classic conceptions of the good-life may be outpaced by production and technological evolution. As we approach the singularity, therefore, Bonhoeffer may help one to radically reconstruct a vision of responsibility toward our fellow humans in the pursuit and affirmation of human dignity. Yet, at present, his anthropology might help guide us towards thinking about what it means to be human in the technological age.

That is, modern human beings are goaded by the promise of technology. The endeavour to overcome the limits of nature in pursuit of improved capacities via

technology has provoked human creative action. This human creativity, however, has also turned inwards as we pursue mastery over our own nature, such that we might overcome our fate, fragility, and finitude. Certainly, this might be regarded as the modern catalyst for “the proliferation of new arts and sciences directed towards human control, ... illustrat[ing] our drive to new technologies of human nature ... developed by people concerned with human betterment.”⁴ Yet it might also be regarded as the catalyst to consider the implications of theology for the human and biotechnological sciences.⁵ The following will explore this further, identifying recent and regular scientific and technological breakthroughs that have challenged our conception of human life and death. For this, I will draw from some of the claims of Raymond Kurzweil, whose advocacy of transhumanism and life extension technologies have garnered wide public attention. In response, the following will also explore how Dietrich Bonhoeffer’s theological anthropology might inform our understanding as technological and biological life are blurred and the panoply of scientific advancements constrain current conceptions of human being and becoming.

Kurzweil's Future Perfect

For those who may be unfamiliar, Raymond Kurzweil is a prolific inventor, author, and futurist. Many regard him as an intellect of profound insight and industry. Others, however, regard Kurzweil as one consumed by a gripping death anxiety pursuing immortality and the technological singularity without caution. Both may be right.

Kurzweil and his vision for the future have been in vogue amidst popular media sources. Lev Grossman's 2011 TIME Magazine article revealed one of Kurzweil's most provocative predictions: by the year 2045, humanity will be immortal.⁶ Robert Barry Ptolemy's 2010 documentary entitled, "Transcendent Man: The life and ideas of Ray Kurzweil," explored not only the predictions of biological and technological evolution but also the motivations behind Kurzweil's life work. These works, and those published by Kurzweil himself, have been met with significant interest among those sensitive to his vision—positively and negatively.

The provocative claims and actual achievements of Kurzweil are interesting. However, two of his forecasts for the future are most captivating: first, before the year 2050, humans will be able to extend their biological lives beyond that which is customary, exceed-

ing lifespans of 120, possibly 150, years. He even makes the claim that with aggressive interventions using contemporary technologies, biomedical modalities, pharmaceuticals, and the like, one is able to advance human capacity in such a way as to realize extraordinary human being, including but not limited to life extension.⁷ Accordingly, for Kurzweil, the possibility of realizing such human capacity and reversing the deleterious effects of aging is no longer fodder for legends regarding the proverbial 'Fountain of Youth' but actual, granted by advances in bioscientific and technological progress. He writes, "we are rapidly gaining the knowledge and the tools to indefinitely maintain and extend the 'house' each of us call his body and brain." Kurzweil continues, "Human life expectancy is itself growing steadily and will accelerate rapidly, now that we are in the early stages of reverse engineering the information processes underlying life and disease."⁸

This leads to the second forecast, "as [humanity] moves toward nonbiological existence, we will gain the means of 'backing ourselves up' (storing the key patterns underlying our knowledge, skill, and personality), thereby eliminating most causes of death as we know it."⁹ Kurzweil has often noted the integration, rather assimila-

tion, of human biology with non-sentient (nano)technologies and artificial intelligences is, and will continue, to occur. The purpose of such pursuits is not only to ameliorate certain biological limitations, but also to radically enhance human capacity so as to transcend the limitations of biological existence.

In many ways, the visions of the future portrayed in both film and print where human biology is infused with technology are no longer science fiction. Biomedical interventions already utilize various technologies as integral means for attenuating hearing loss (cochlear implants), epileptic disorders (intracranial electrodes), and amputation (neurologically controlled robots limbs), for example. Charismatic h+ [transhumanist] apologists and researchers such as Kurzweil, along with Raj Reddy, Dean Kaman, and others, have vigorously pursued biotechnologies and related disciplines to determine how technology may aid human biology and enhance it, even replacing it when possible. For these individuals, "The singularity will allow us to overcome age-old human problems and vastly amplify human creativity. We will preserve and enhance the intelligence that evolution has bestowed on us while overcoming the profound limitations of biological evolu-

tion."¹⁰

Indeed, for many, the possibility of realizing profound expressions of human capacity and reversing the pathology of aging is an authentic and imminent reality. The goal is not only to extend the human lifespan by decades but also to radically alter the lived human experience and transcend human limitations.¹¹ The goal is to coinhere the promise of human intelligence with the exponential possibility of technology. That is, the goal is to master technology to such a degree that humanity may succeed the biological boundary and discover, if you will, new and profound expressions of human existence.

Really, there are many questions that arise from reading h+ literature, including the works of Ray Kurzweil. However, I want to focus on one in the following in conversation with Dietrich Bonhoeffer. This question concerns the very meaning of humanity. What does it mean to be human?

Humanity 2.0: Kurzweil's Dualism and Bonhoeffer's Authentic Human

In his 4 March 1949 poem, Dietrich Bonhoeffer poses the question, "Who am I?" This is a loaded ontological question at best. It is one that I will not take on in detail here either. However, it is a critical

question for us as we leap exponentially toward the ever-progressing and uncertain future propelled by technological progress and the patterns of artificial intelligence, genetics, and nanotechnology. It is a future that some describe with hope-filled anticipation while others with impending doom. Consequently, the radical forms of progress yet to be encountered demand reflection on this question, "Who am I?" Yet, in light of Kurzweil's predictions, this one question may raise another, to be asked simultaneously, "What am I?"

Undergirding Kurzweil's pursuit of health and radicalized notions of technology-driven wellbeing reposes a great discontentment. There seems to be evidence of a great contempt for the penultimate: a disdain for real humanity and the conditions of human existence. Kurzweil writes,

Our version 1.0 biological bodies are ... frail and subject to a myriad of failure modes, not to mention the cumbersome maintenance rituals they require. While human intelligence is sometimes capable of soaring in its creativity and expressiveness, much human thought is derivative, petty, and circumscribed. ... [O]ur technology will match and then vastly exceed the refinement and suppleness of what we regard as the best

of human traits.¹²

His hope that the limits of bodily existence will be surpassed by technological evolution reveals a rather Gnostic perspective regarding human ontology: "My body is temporary. Its particles turn over almost completely every month. Only the patterns of my body and brain have continuity."¹³ The trouble for the critic is that Kurzweil is partly correct. Our bodies are frail, finite, and fractured. Human life is limited by the fate of all that is physical: decay and death.

Accordingly, it is the very patterns of biology that concerns Kurzweil. In the patterns, as he conceives, one may discover the essence of our being. If those patterns may be duplicated, rather anchored or transposed, on silicone chips and cyber-space clouds, then our patterns, our very being may continue forever—for the progress of technology will ensure the continued production of more complex technologies that may serve to 'house' our patterns, viz. our existence. That is, in place of our known human experience, Kurzweil has constructed a technology-driven alternative future, where humanity may transcend both time and place, exchanging a rather Cartesian human existence of mind-trapped-in-body for the equally Cartesian *brave new world* where the patterns of biology are

reanimated as zeroes and ones, i.e., bit and qubits. The point of such, so-called, transcendence is to move beyond and/or to relieve the human condition of bodily limits and trial. However, this does not answer the questions, "Who am I? What am I?" Nor does it adequately address the illusion of freedom, for patterns freed from biology will still be bound within some material form. That is, it seems to me that Kurzweil, in protest against reality, is attempting to shape himself into an absolute controller of destiny. In this, he is in denial of the human condition: "that we are born simultaneously worms and gods [finite and infinite]." ¹⁴

So, "Who am I?"

Maslow's description of the human condition is striking; however, Bonhoeffer would qualify such a statement with a reminder that God, in the Christian understanding of His condescension, is the primal human, limited by time and flesh. For many, this is a controversial doctrine, for it is understood as ontologically opposed to the sovereignty of God. However, for Bonhoeffer, the incarnation is the defining feature of God's omnipotence—he wills to become that which he is not in order to redeem that which he loves, his creation. Moreover, the incarnation, for Bonhoeffer, becomes central

to understanding not only his humanism but also his guiding social theory, which is significant for understanding and instruction. That is, Bonhoeffer's humanistic orientation, discerned via his Christology, might not only bear fruit in relation to but also radically reconstruct a vision of responsibility toward other human beings. It is vital for "affirm[ing] human dignity through a recovery of classical culture and ... in harmony with Christian faith." ¹⁵

Therefore, in contradistinction to Kurzweil, Bonhoeffer's anthropology is anchored on a theological ground rather than upon some sort of ambiguous philosophical variable or temporal scientific observation, such as capacity or consciousness. His Christology illuminates his "affirmation of life in its fullness amidst struggle and suffering." ¹⁶ Indeed, human dignity takes centre stage, though that stage is built upon the incarnation Christ and his death on the cross. That is, for Bonhoeffer, one is directed toward God's "No," which is known only in light of God's "Yes," that surrounds it, in Jesus Christ. Bonhoeffer's humanity is theologically constructed from this pattern where the Divine "Yes" to humanity in Christ affords an understanding of creation, becoming, honour, and flourishing in contrast to and in opposition

against death, suffering, degradation, and resignation.¹⁷

Accordingly, in Bonhoeffer's reflection on his Lutheran Christology,

God did not become an idea, principle, a program, a universally valid belief, or a law. God became human. That means ... Christ does not abolish human reality in favour of an idea that demands to be realized against all that is real. Christ empowers reality, affirming it as the real human being and thus the ground of all human reality.¹⁸

Indeed, these words stridently stand against the vision of an unrealized, frail, and unsatisfied human existence, as Kurzweil tends to illumine. Rather, in suffering, frailty, and limitedness, in every noble and ignoble part of human being, Jesus Christ reveals an all-embracing humanism.¹⁹ Christ is *really* human.

Therefore, if Jesus Christ is really human, he is not a projected ideal or a techno-evolved reinterpretation of Nietzsche's *Übermensch* [overman, superman]. For Bonhoeffer, the incarnation defines God's relation to the world; such that, in Christ, "the reality of God encounters the reality of the world and allows [humanity] to take part in this real encounter."²⁰ That is, for Bonhoeffer, "[Jesus] is not a human being, but *the* hu-

man being. What happened to him happens to human beings. It happens to all and therefore to us."²¹ In an act of solidarity, God occupies time and space, vindicating human existence as authentic, real, and good. Consequently, for Bonhoeffer, authentic human life means being *Menschen* [human] in the gratuitousness of Christ's life, death, and resurrection: "The message of God's becoming human attacks the heart of an era when contempt for humanity or idolization of humanity is the height of all wisdom."²² That is, as Bonhoeffer argues,

Only because God became human is it possible to know and not despise real human beings. Real human beings may live before God, and we may let these real people live beside us and before God without either despising or idolizing them. This is not because of the real human being's inherent value, but because God has loved and taken on the real human being. The reason for God's love for human being does not reside in them, but only in God. Our living as real human beings, and loving the real people next to us is, again, grounded only in God's becoming human, in the unfathomable love of God for us human beings.²³

So, who am I? I am a real human being.

Furthermore, in contrast to

Kurzweil's dualism, Bonhoeffer is strident to instruct that the body is neither the prison, nor the shell, nor the façade that hides our real being. Rather, in his exegesis of Genesis 2:7, Bonhoeffer writes, "instead a human being is a human body."²⁴ The very ontological centre of humanity, that which links both Adam and Christ, old humanity and new, is the physical body.²⁵ Consequently, Bonhoeffer warns, those who may reject the body fail to answer the corollary question, "What am I?" If, as he suggests, a human being *is* a body, rejection of one's body is, in turn, a complete rejection of one's existence. In fact, it is not only a rejection of one's existence but also a rejection of the form of God's own self-disclosure, in Jesus Christ.²⁶

Bonhoeffer is clear; the very bodily existence of both the human creature and of Christ constitutes a particular union for it is the body that affords the relation humanity has with not only Christ but also the earth and other humanity. It is bodily existence, wherefore, one may "find their brothers and sisters and find the earth."²⁷ This may challenge, radically, any pursuit of singularity-proposed transcendence or disembodied existence. Yet, as Kurzweil's future unravels

and the technosapien emerges, will such a union dissolve?

This may be an important question to consider. Although, one I may take up at a later time. My hunch is, as Bonhoeffer connects human bodily existence to the earth, and the various materials required to manufacture various technologies are derived from that which the earth provides, our relation to both natural and enhanced humanity will not be suspended. Rather, the politics of difference may be rekindled and new, profound expressions of segregation and bigotry experienced. For example, the economic disparity that exists now might only exaggerate the differences between rich and poor. It may be that only those who have the financial means to acquire Kurzweil's future will while those without financial means may simply remain, struggling to be seen and to survive—a genetically and technologically inferior humanity left behind by the economics of technological evolution.

Such peril is but one risk raised by Kurzweil's project. Another may be much more subversive: that being the question of who, or what, is in control?

References

- Bonhoeffer, Dietrich, 1997, *Creation and Fall: A Theological Exposition of Genesis 1-3*, Douglas Stephen Bax, (trans.), Vol. 3, Dietrich Bonhoeffer Works, Jr. Wayne Whitson Floyd (ed.), Minneapolis: Fortress Press.
- 2005, *Ethics*, Reinhard Krauss, Charles C. West and Douglas W. Stott (trans.), Vol. 6 Dietrich Bonhoeffer Works, Wayne Whitson Floyd Jr. (ed.), Minneapolis: Fortress Press.
- Grant, George, 1986, *Technology and Justice*, Concord: House of Anansi Press.
- Jonas, Hans, 1979, 'Toward a Philosophy of Technology,' *Hastings Center Report*, 9, 1: pp. 34-43.
- Kierkegaard, Søren, 1941, *Sickness Unto Death*, Princeton: Princeton University Press.
- Kurzweil, Ray, 2006, *The Singularity Is Near: When Humans Transcend Biology*, New York: Penguin Publishers.
- Kurzweil, Ray, and Terry Grossman, 2004, *Fantastic Voyage: Live Long Enough to Live Forever*, Emmaus: Rodale Books.
- Lash, Nicholas, 1996, *The Beginning and the End of Religion*, Cambridge: Cambridge University Press.
- Maslow, Abraham, 1968, *The Psychology of Being*, New York: Harper & Row.
- McKenny, Gerald, 1997, *To Relieve the Human Condition : Bioethics, Technology, and the Body*, Albany: State University of New York Press.
- Transhumanist Declaration*, 2009, <http://humanityplus.org/philosophy/transhumanist-declaration/> (accessed Sept 2012).
- Wüstenberg, Ralk K, Stephen Heuser, and Esther Hornung (eds.), 2010, *Bonhoeffer and the Biosciences: An Initial Exploration*, International Bonhoeffer Interpretations, Frankfurt am Main: Peter Lang.
- Zimmerman, Jens, and Brian Gregor (eds.), 2010, *Being Human Becoming Human: Dietrich Bonhoeffer and Social Thought*, K. C. Hanson, Charles M. Collier and Christopher D. Spinks (eds.), Princeton Theological Monograph Series. Eugene: Pickwick.

Notes

- ¹ An expanded version of this paper was delivered at the Australia Bonhoeffer Conference (Kincumber, NSW), where I was honoured as the 2011 Flechtheim Scholarship award winner for constructive engagement with the ethics of Dietrich Bonhoeffer.
- ² Gerald McKenny, 1997, *To Relieve the Human Condition : Bioethics, Technology, and the Body*, Albany: State University of New York Press, p. 7.
- ³ Ray Kurzweil, 2006, *The Singularity Is Near: When Humans Transcend Biology*, New York: Penguin Publishers, p. 7.
- ⁴ George Grant, 1986, *Technology and Justice*, Concord: House of Anansi Press, 16.
- ⁵ Certainly, I ask this question with others who suggest such a question is vital and to be asked in the order presented: What are the implications of theology for the biosciences, and the like?" (See Nicholas Lash, 1996, *The Beginning and the End of Religion*, Cambridge: Cambridge University Press, p. 78.)
- ⁶ Taking up Kurzweil's interest in life extension research and technologies, TIME magazine's recent cover story has revealed that the Internet search engine giant Google will be "launching a venture to overcome death." (See the 30 September, 2013 issue of TIME magazine.)
- ⁷ Ray Kurzweil and Terry Grossman, 2004, *Fantastic Voyage: Live Long Enough to Live Forever*, Emmaus: Rodale Books, p. 489.
- ⁸ Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, p. 323.
- ⁹ Ibid. Here Kurzweil uses the word, "patterns," quite purposefully. He writes in support of his patternist rather than materialist philosophy, "I am rather like a pattern that water makes in a stream as it rushes past the rocks in its path. The actual

molecules of water change every millisecond, but the pattern persists for hours or even years. Perhaps, therefore, we should say I am a pattern of matter and energy that persists over time." (ibid., p. 383.)

¹⁰ Ibid., p. 21.

¹¹ According to the *Transhumanist Declaration*, "Humanity stands to be profoundly affected by science and technology in the future. We envision the possibility of broadening human potential by overcoming [mortality]." ('Transhumanist Declaration,' 2009)

¹² Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, p. 9.

¹³ Ibid., p. 371.

¹⁴ Abraham Maslow, 1968, *The Psychology of Being*, New York: Harper & Row, p. 94. See also Søren Kierkegaard's discussion, through his pseudonym Anti-Climacus, on the synthesis of humanity, which excites a particular anxiety as one balances, if you will, the dialectical tension of being both finite and infinite, temporal and eternal, bodily and soulful (Søren Kierkegaard, *Sickness Unto Death*, p. 9.)

¹⁵ Jens Zimmerman and Brian Gregor, 2010, p. 3.

¹⁶ Ibid., p. 17.

¹⁷ Ibid., p. 18.

¹⁸ Dietrich Bonhoeffer, 2005, p. 99.

¹⁹ Zimmerman and Gregor, p. 27.

²⁰ Bonhoeffer, p. 159.

²¹ Ibid., p. 85. Emphasis in the original.

²² Ibid.

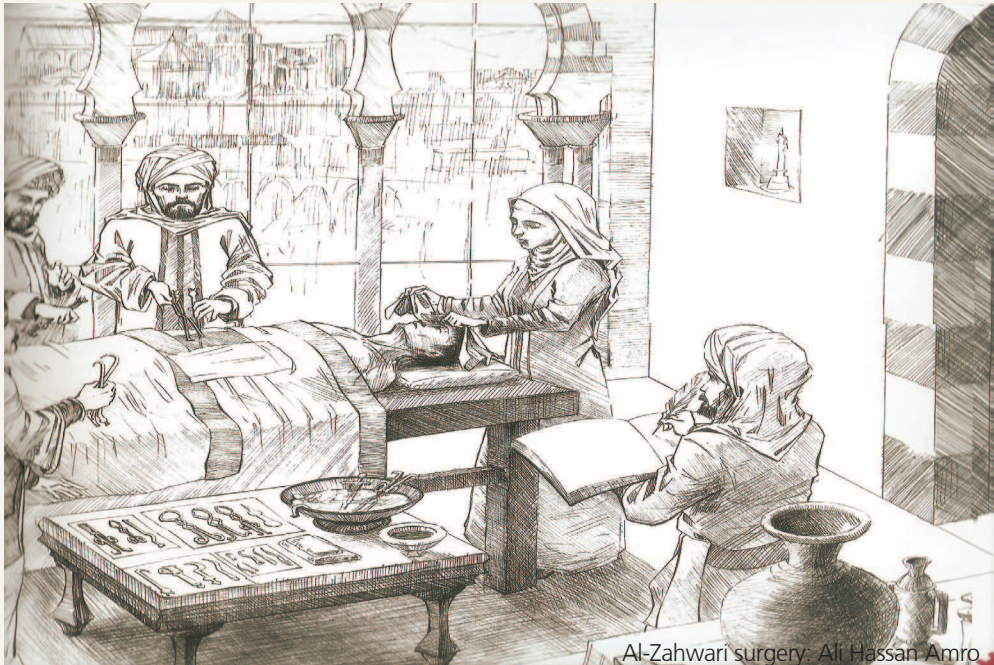
²³ Ibid., p. 87.

²⁴ Dietrich Bonhoeffer, 1997, p. 77.

²⁵ Bonhoeffer argues, "Adam is created as body, Adam is also redeemed as body [and God comes to Adam as body], in Jesus Christ and in the sacrament." (ibid., p. 79)

²⁶ Bonhoeffer writes, accordingly, "God loves the world. Not an ideal human being, but humans as they really are. ... The despiser of humanity despises what God has loved, despises the very form of God become human." (Bonhoeffer, *Ethics*, p. 84, p. 87)

²⁷ Bonhoeffer, *Creation and Fall*, p. 79.



Al-Zahwari surgery: Ali Hassan Amro

Qu'ranic Foundation of Islamic Science

By Senad Mrahorovic

Introduction

Every aspect of the Islamic religion from intellectual and doctrinal to jurisprudential and practical domains has its origin in the Qur'ān or the Sunnah of the Prophet. The concept of Islamic science, which includes all of the highly significant and enormously rich intellectual and scientific enterprise that Muslims and non-Muslims living under the umbrella of the Islamic civilization have produced for the past fourteen centuries, is of no exception. Since the principles of Islam are all contained in the Qur'ān as the primary source of everything that is Islamic, and the

Sunnah as the key interpretation of the former, the implementation of the said principles by the virtue of their origin could not have, but taken place within the framework of Islamic worldview or environment. Concerning the idea of knowledge in Islam, it might be said that from the starting point of the Qur'ānic revelation, it was given an islamized character by the very first verses of the Qur'ān: "Read in the name of your Lord". An added value to its islamization is the fact that the first and foremost principle of Islam, namely the *Shahādah*, that is, *Lā ilāha*

ill'Allāh, implies both certainty of knowledge and undeniable faith. In this essay, I will discuss the Qur'ān as the main source for the development of Islamic science.

Qur'anic conception of knowledge

The notion of knowledge is deeply rooted in the vocabulary of the Qur'anic revelation and it has been articulated in a number of different linguistic forms among which are the roots *'ilm*, *fqh*, *'aql*, *bsr*, *qlb* and their various derivatives respectively, that were frequently employed within the language of the Qur'ān. For example, the root *'ilm* with a number of its verbal derivations, appears in the Qur'ān about 750 times¹. Regardless of possible reasons behind the frequent usage of the notions related to knowledge, understanding, spiritual illumination and vision and other terms, it is certain that the Qur'anic usage of them has brought the aspect of knowledge in Islam as an almost inseparable component of the Islamic faith². Indeed, the first part of the testimony of faith in Islam "is a statement of knowledge concerning Reality"³. The knowledge in question refers to the awareness of God who created the entire cosmos and the whole chain of hierarchical beings contained within. In traditional

Islamic thought, this knowledge is called *'Ilm al-Tawhīd* or in its more philosophical treatment *al-'Ilm al-Ilāhī*, that is, the science of Divine Unity or metaphysics⁴. *'Ilm al-Tawhīd* is regarded as the most praiseworthy and most beneficial knowledge towards which all other avenues of intellectual and scientific inquiries should lead to. In al-Ghazālī's classification of sciences for instance, the science of *Tawhīd* appears at the head of the sections of both religious and intellectual divisions of sciences⁵. In one of his many works, al-Ghazālī writes: "The Highest and noblest knowledge is the knowledge of God because all other forms of knowledge are sought for the sake of it and it is not sought for anything else"⁶. Another prominent intellectual figure from classical period of Islamic civilization, namely, Ibn 'Arabī, like al-Ghazālī, has widely written in this domain of study. In his reflection on the importance of knowledge of Divine Unity, Ibn 'Arabī has stated that "[t]he intelligent person should not seek any knowledge save that through which his essence is perfected and which is carried along with him wherever he may be taken. This is not but knowledge of God in respect of bestowal and witnessing"⁷. Today, in a similar fashion Seyyed Hossein Nasr, a

leading contemporary authority on Islamic thought and philosophy has argued that the “real nature of intelligence is ultimately to come to realize that *Lā ilāhe illa’Allāh*, that is to come to know that in the end there is only one Absolute Reality. It is to realize the absolute nature of Allāh and the relativity of all else that is other than He”⁸. This knowledge of *Tawhīd* in Islam is regarded as the supreme knowledge or the highest truth since it concerns the knowledge and truth of the Highest, that is, the Supreme Reality⁹.

Needless to say, the above-mentioned views and numerous other statements by Muslim scholars on the supremacy of *‘Ilm al-Tawhīd* over other types of sciences are almost solely based on the Qur’anic and Sunnatic treatments of the subject of knowledge and its related themes. In both these sources respectively, knowledge is often linked to faith or treated as a Muslim’s religious duty. A few instances from the Qur’ān and Hadīth may be sufficient to justify this: “Among His servants, only those who have knowledge (*‘ulamā*) are God-fearing” [Qur’ān, 35:28]; “God will raise in rank those of you who believe and who are given knowledge” [Qur’ān, 58:11]; “The seeking of knowledge is obligatory for every Muslim” [Ibn Mājah, 224].

In the case of various branches of Islamic science, the principle of Divine Unity has always dominated other aspects of knowledge. Despite numerous methods used to study different subjects, the aim of Muslim scholars and scientists has always been to underline the Unity of God and consequently the unicity of nature in which everything is being perceived as a symbol pointing to the Divine Principle as the Cause of all that exists in the created realm of reality. This is best explained by Seyyed Hossein Nasr in the following statement: “One might say that the aim of all the Islamic sciences – and, more generally speaking, of all medieval and ancient cosmological sciences – is to show the unity and interrelatedness of all that exist, so that, in contemplating the unity of the cosmos, man may be led to the unity of the Divine Principle, of which the unity of Nature is the image”¹⁰.

The relationship between knowledge and Islamic faith however, may well be illustrated by considering the first revealed portion of the Qur’anic revelation and the symbolism and messages they portrayed. Having in mind the importance of knowledge in the Islamic intellectual tradition and its correlation with religious dogmas, it is not surprising that the starting point of the Islamic revelation is

almost exclusively concerned with knowledge and its source on the one hand, and the way of obtaining knowledge and its ultimate aim on the other hand. The first revealed verses of the Qur'ān, which form the opening part of the *Sūrah al-'Alaq* (the chapter of the Clinging Clot), state the following: "Read! (Recite!) In the name of your Lord and Cherisher, Who created - Created man, out of a (mere) clot of congealed blood: Read! And your Lord is Most Bountiful, - He Who taught (the use of) the Pen, - Taught man that which he knew not" (Qur'ān, 96:1-5). This Qur'anic text immediately projects the three main principles among others, concerning knowledge in the context of the relationship between God and humankind, namely, the recitation or bearing witness to the reality or truth in the name of God; Divine creation of a human as an intelligent being; and Divine teaching and illumination of human being. In the traditional Islamic perspective, each of the above principles reflects certain elements that are directly or indirectly connected to the Islamic character of science developed within the Islamic worldview.

Concerning the first principle, that is, *iqra' b-'i-smirabbika* or 'Read (Recite) in the name of your Lord', it is strongly indicated that the presence of the Divine

in hearts and minds of Muslims is clearly demanded for every action or thought conducted by a Muslim, especially when it comes to seeking truth and discerning it from falsehood¹¹. The act carried out in this manner partakes in the sacred be it of a worldly or of a spiritual nature. From the simplest conduct to the noblest deed, from the basic education to the higher contemplation, a Muslim is thus able to sanctify or transcend his action, intellection and imagination by adhering to the message of the above verses or simply to the *shahādah* which, for its part implies, not only one's verbal witness to the oneness of God and the messengerhood of the Prophet but also a certitude and intellectual recognition of the truth that it expresses. It is in this context according to Nasr, that the Prophetic hadīth that states: "Say *Lā ilāha ill'Allāh* and be delivered", should be understood¹².

On the other hand, the imperative form of the verb *qara'a* by which the Islamic revelation has commenced is very significant for two main reasons. The first one is that the infinitive form of this verb, that is, *qur'ān* or recitation, is the very name of the Islamic revelation, while the second one is that in Islam a book (*al-kitāb*), yet another name of the Qur'ān¹³, is the crystallization of the Divine

revelation in human language as well as the ultimate container of the Divine Word¹⁴. The Qur'ān therefore is at once a recitation, a discernment and a book of Divine signs (*āyāt*) which besides its clear exoteric meaning also possesses the inner character or esoteric denotation hidden by veils of numerous layers of symbolism that is beautifully as well as miraculously expressed by the Divine Arabic dictation in the Qur'ān. That is why the Qur'ān is regarded, in the intellectual tradition of Islam, as the source of all knowledge. From the Islamic perspective, writes Nasr, "all knowledge is contained in essence in the Qur'ān, the knowledge of all orders of reality. But this knowledge lies within the Qur'ān in essence, or as a seed and in principle, not in formal detail"¹⁵.

The second principle derived from the foregoing verses (*alladhī khalaqa*), is the Divine creation of the cosmos and all what it contains. It is precisely in the light of this principle that Muslim scholars and scientists have approached the world and its phenomena. As the sources of various kinds of knowledge vary, the created world of nature with its multiple levels of being represented an important source for the development of numerous sciences "physical and metaphysical; scientific to spiritual;

qualitative to quantitative; practical and aesthetical"¹⁶. Here it would be sufficient to mention that the countless facts, occurrences and sights contained in nature are regarded as signs (*āyāt*) pointing to the transcendental reality. In the same way, the verses of the Qur'ān are called *āyāt*. Both types of *āyāt* are considered sacred simply because of their Divine origin and purpose of their manifestation in the created order of reality. The Qur'ān states: "We shall show them our signs (*āyātina*) upon the horizons and within themselves, until it be manifest unto them that it is the Truth" [Qur'ān, 41:53]¹⁷. Based on this almost equal meaning and the role shared between the natural and the Qur'anic signs, some Muslim scholars have called natural phenomena as the *al-Qur'ān al-Takwīnī*, compared to the *al-Qur'ān al-Tadwīnī* which refers to the actual form of Islamic revelation¹⁸.

As for the purpose of this Divine creation, the Qur'ān has made it clear in the following verses: "I have only created *Jinn*¹⁹ and men that they may worship Me" [Qur'ān, 51:56], or "In the creation of heavens and earth... there are indeed Signs for men of understanding" [Qur'ān, 3: 190]. Here the verses clearly show the essential obligation of men and other creatures towards

their Creator and Sustainer, an obligation that in the case of human being can only be adequately achieved by the virtue of proper knowledge. Being Divine vicegerent on earth with the responsibility of his conducts towards himself and the entire creation therein, over which he was given the dominance²⁰, and ultimately towards God to whom he will finally return, man is created in the “best of stature” [Qur’ān, 95:4]. He is the central being in this world to whom God has revealed the knowledge of all things, or to whom the Divine revelation was primarily addressed²¹. This indeed implies that man is the only being endowed with the faculties of knowing not only the physical aspect of things, as it is the case with the modern scientific epistemology, but also and most importantly the metaphysical aspect of reality. The superiority of man among other created beings is marked by the words of the aforementioned second verse of the *Sūrah al-‘Alaq*: “*khalaqa al-insāna min ‘alaq*”, whereby he was given an honor and superiority over other created beings to be mentioned at the first place in the opening verses of the Qur’ān²².

This brings us to the third principle contained in the cited verses that is, the Divine teaching and enlightenment of man (*‘allama*

al-insāna). The process however of this kind of teaching involves, besides the utilization of the mentioned faculties of knowing, the highest level of certainty in one’s faith in God, the unconditional devotion to Him and the total submission to His Will. As the traditional Islamic classifications of knowledge suggests, there are numerous methods of obtaining knowledge. Among these are mystic vision (*mushāhadah*) and illumination (*mukāshafah*), known in Sufi terminology as *al-‘Ilm al-Hudūrī*, that is, presential knowledge. It is also called *al-‘Ilm al-Ladunnī* (Divinely taught or inspired knowledge) or simply *al-ma’rifah* (illuminative knowledge). Compare to attained knowledge or knowledge gained by cognitive senses, presential knowledge is direct, metaphysical, intuitive and contemplative²³. For the traditional Islamic scholars, presential knowledge is regarded as the highest level of knowledge and understanding of reality. In the Qur’anic vocabulary, it is identified with “*haqq al-yaqīn*” or truth of certainty. According to Ibn ‘Arabī, presential knowledge is possible only by Divine Will and not by one’s own efforts. However, the key for this possibility of knowledge is being revealed in the Qur’anic verse: “Be wary of God, and God will teach you” [Qur’ān, 2:282]²⁴.

Development of Islamic Science

Since the essential teaching of Islam is to believe in and know the unity of God or *Tawhīd*, the rest of the Islamic economy of doctrines and practices is centered upon this truth. The issue of Islamic science may serve as the best example of how the different kinds of knowledge encompassed by the Islamic revelation have been intellectually perceived and as such practically implemented by generations of Muslim scholars and scientists. As the Qur'ān contains the fundamental principles of Islam that were perfectly elaborated and explained by the Prophet of Islam through his Sunnah (verbal and practical teachings of the Prophet)²⁵, the logical priority for the first few generations of Muslim scholars was to safeguard the sources of their religion, namely, the Qur'ān and the Sunnah. In due course they have embarked on the path which will lead them to the highest intellectual summits that were hardly reached by any civilization prior to Islam. Before any serious intellectual influence upon the rising civilization of Islam, a great deal of religious sciences alongside a number of linguistic and artistic disciplines were developed by way of studying and commenting the Qur'ān and the Sunnah. From various theological treatises, exegetical

works, juridical argumentations to numerous sciences dealing with Hadith literature as well as Arabic language as the *lingua sacra* of Islam, the entire corpus of the Islamic literature was created by the end of the second century of Islamic era. The technical vocabulary used in these works as well as in the later periods of the intellectual history of Islam, was mainly constructed based on the Qur'anic and Prophetic terminologies. For example, the terms such as *tawhīd*, *fiqh*, *hikmah*, *tafsīr*, *ta'wīl* and others were all taken directly from the Qur'ān to form later different branches of Islamic science²⁶.

These scholarly and scientific activities during the first two centuries of Islam, have formed the intellectual as well as epistemological basis for the further expansion of Islamic science. In the view of Alparslan Acikgenc, this period was crucial for the emergence of three 'mental frameworks' as the fundamental conditions for the development of Islamic science, namely, the emergence of the Islamic worldview as the environment for the Islamic science, the emergence of the Islamic-knowledge structure within the Islamic worldview and the emergence of the Islamic scientific tradition. The first two frameworks are said to be

developed during the Prophet's lifetime in Mecca and Madinah respectively, while the third framework developed as the result of the intellectual and practical implementation of the Qur'anic principles related to knowledge by the first generation of Muslim scholars headed by the Prophet himself. The early intellectual activities introduced directly by the Prophet of Islam under the guidance of the Qur'anic revelation was later expanded and transformed into a sophisticated system of knowledge which, with its own and unique methodology and epistemology, became the leading scientific tradition in

the world for several centuries until the rise of the Western Renaissance²⁷. In other words, the Qur'anic insistence on the importance of knowledge and its close relationship with the principles of the Islamic religion as was illustrated using the first five verses of the *Sūrah al-'Alaq*, has made the Islamic civilization not only the intellectual inheritor of ancient scientific traditions, a great part of which has been Islamized, and as such incorporated into the corpus of the Islamic intellectual tradition, but also a rich source for the intellectual and scientific revolution in Europe during the latter's period of enlightenment.

Bibliography

- Acikgenc, Alparslan, 1996, *Islamic Science: Towards A Definition*, Kuala Lumpur: International Institute of Islamic Thought and Civilization (ISTAC).
- 'Alī, 'Abdullah Yūsuf, 2005, *The Meaning of the Holy Qur'ān: Complete Translation with Selected Notes*, Kuala Lumpur: Islamic Book Trust.
- Al-A'zami, Mustafa Muhammad, 2011, *The History of the Qur'anic Text from Revelation to Compilation: A comparative Study with the Old and New Testaments*, Kuala Lumpur: Islamic Book Trust.
- Bakar, Osman, 1998, *Classification of Knowledge in Islam*, Cambridge: Islamic Texts Society.
- 1999, *The History and Philosophy of Islamic Science*, Cambridge: Islamic Text Society.
- Chittick, C. William, 2006, 'Ibn 'Arabi on the Benefit of Knowledge', in Seyyed Hossein Nasr and Catherine O'Brien (eds.), *The Essential Sophia*, Bloomington: World Wisdom Inc.
- Haqqī, Ismā'il, *Rūh al-Bayān fī Tafsīr al-Qur'ān*, www.altafsir.com.
- Ibn Mājah, 'The Book of Sunnah' *Sunan*, www.sunnah.com.
- Izutsu, Toshihiko, 2002, *God and Man in the Qur'an: Semantics of the Qur'anic Weltanschauung*, Kuala Lumpur: Islamic Book Trust.
- Nasr, Seyyed Hossein, 2000, *Ideals and Realities of Islam*, Chicago: ABC International Group, Inc.
- 1993, *An Introduction to Islamic Cosmological Doctrines*, New York: State University of New York Press.
- 1989, *Knowledge and the Sacred*, New York: State University of New York Press.
- 1987, *Science and Civilization in Islam*, Cambridge: The Islamic Texts Society.
- 2007, *The Garden of Truth: The Vision and Promises of Sufism, Islam's Mystical Tradition*, New York: HarperOne.
- Rosenthal, Franz, 2007, *Knowledge Triumphant: The Concept of Knowledge in Medieval Islam*, Leiden: Brill.

Notes

- ¹ Franz Rosenthal, 2007, *Knowledge Triumphant: The Concept of Knowledge in Medieval Islam*, Leiden: Brill, pp. 19-20.
- ² See for example some of Rosenthal's speculation in this regard, *Ibid.*, pp. 19-28.
- ³ Osman Bakar, 1999, *The History and Philosophy of Islamic Science*, Cambridge: Islamic Text Society, pp. 1.
- ⁴ For the detailed discussion of this subject, see Osman Bakar, 1998, *Classification of Knowledge in Islam*, Cambridge: Islamic Texts Society, pp. 207-210.
- ⁵ Osman Bakar, *Ibid.*, pp. 207-210.
- ⁶ Al-Ghazālī, *The Jewels of the Qur'ān*, pp. 43, as cited by Osman Bakar, *Ibid.*, pp. 197.
- ⁷ 'Risālat al-Shaykh ilā'l-imām al-Rāzī', pp. 6-7, *Rasā'il Ibn 'Arabi*, 1996, Hyderabad-Deccan: The Dairatu'l Ma'rifi'l-Osmania as cited by William C. Chittick in his 'Ibn 'Arabi on the Benefit of Knowledge', in Seyyed Hossein Nasr and Catherine O'Brien, (Eds.), 2006, *The Essential Sophia*, Bloomington: World Wisdom Inc., pp. 129.
- ⁸ Seyyed Hossein Nasr, 2000, *Ideals and Realities of Islam*, Chicago: ABC International Group, Inc., pp. 5-6.
- ⁹ Seyyed Hossein Nasr, 2007, *The Garden of Truth: The Vision and Promises of Sufism, Islam's Mystical Tradition*, New York: HarperOne, pp. 34.
- ¹⁰ Seyyed Hossein Nasr, 1987, *Science and Civilization in Islam*, Cambridge: The Islamic Texts Society, p. 22.
- ¹¹ Among the names by which the Qur'ān addressed itself is *al-Furqān* or the discernment, [Qur'ān, 25:1]. The Qur'ān therefore is the criterion by which one is able to distinguish between truth and falsehood, good and evil, Absolute and relative or as the Qur'anic verse states: "These are the verses (*āyāt*) of the Book that makes things clear" [Qur'ān, 26:1].
- ¹² Seyyed Hossein Nasr, 1989, *Knowledge and the Sacred*, New York: State University of New York Press, p. 11.
- ¹³ "This is the Book; in it is guidance sure, without doubt, to those who fear God" [Qur'ān, 2:2].
- ¹⁴ Seyyed Hossein Nasr, *Ideals and Realities of Islam*, p. 32.
- ¹⁵ *Ibid.*, p. 39.
- ¹⁶ Osman Bakar, *Ibid.*, pp. 63.
- ¹⁷ With a slight modification this verse was cited from Seyyed Hossein Nasr, 1993, *An Introduction to Islamic Cosmological Doctrines*, New York: State University of New York Press, p. 6.
- ¹⁸ Professor Toshihiko Izutsu has stated that in terms of Divine intervention in human affairs, there is no difference between linguistic and non-linguistic signs, since both types represent Divine *āyāt*, Toshihiko Izutsu, 2002, *God and Man in the Qur'an: Semantics of the Qur'anic Weltanschauung*, Kuala Lumpur: Islamic Book Trust, pp. 142-143.
- ¹⁹ Jinn are beings "of fire" existing in the intermediary realm between the celestial and the physical realms, who are normally unperceived by unaided human vision.
- ²⁰ "It is He Who has made the earth manageable for you, so traverse you through its tracks and enjoy of the Sustenance which He furnishes: but unto Him is the Resurrection" [Qur'ān, 67:15].
- ²¹ "And He taught Adam the nature of all things" [Qur'ān, 2:31].
- ²² Ismā'il Haqqī, "Tafsīr Sūrah al-'Alaq" in *Rūh al-Bayān fī Tafsīr al-Qur'ān*. The complete Tafsīr is available at www.altafsir.com. On the supremacy of man over other created beings see also the following Qur'anic verses: 2:30; 31:20; 95:4.
- ²³ Osman Bakar, *Ibid.*, pp. 194-195, 204.
- ²⁴ William C. Chittick, *Ibid.*, p. 129.
- ²⁵ For detailed study of this subject see Mustafa Muhammad al-A'zami, 2011, *The History of the Qur'anic Text from Revelation to Compilation: A comparative Study with the Old and New Testaments*, Kuala Lumpur: Islamic Book Trust, pp. 59-81.
- ²⁶ Alparslan Acikgenc in his excellent study of 1996, *Islamic Science: Towards A Definition*, Kuala Lumpur: International Institute of Islamic Thought and Civilization (ISTAC), has offered much extended list of the scholarly and scientific terms adopted from the Qur'ān during the first two centuries of Islam. See the section entitled "The Emergence of the Islamic Scientific Tradition" (10-200 A.H./632-800 A.D.) in the author's cited work.
- ²⁷ Alparslan Acikgenc, *Ibid.*, pp. 63-92.



Medieval Muslim Trigonometry: Ali Hassan Amro

Book Review

John B. Cobb, Jr. (ed.), 2012, *Religions in the Making: Whitehead and the Wisdom Traditions of the World*, Eugene, Oregon: Cascade Books, 229 pp.

In 1926, the philosopher and mathematician Alfred North Whitehead published his seminal work, *Religion in the Making*, reflecting on the place of religion in human life in light of his innovative cosmology. In this work Whitehead lamented that neither Christianity nor Buddhism had engaged in a full dialogue with contemporary science and cosmology, and he hoped for such reflection in the future. Three years later, Whitehead published a more systematic reflection on God and the cosmos, *Process and Reality: An Essay in Cosmology*. Departing from most traditional monotheistic approaches, Whitehead presented creativity as the ultimate in his philosophy of organism, and he viewed God as its primordial accident. For Whitehead, God does not create the universe out of nothing, does not radically transcend the world, and is not omnipotent. Whitehead saw God as constantly interacting with the world, receiving each event into the divine life and proposing a divine aim for each new occasion, operating by persuasion, not coercion. While Whitehead was not a professional theologian, his philosophy of organism had an important influence on many Christian

theologians in the decades that followed, and Mordecai Kaplan developed the ideas for Reconstructionist Judaism in awareness of Whitehead's work.

In *Religions in the Making*, one of the most distinguished leaders of Christian process theology, John B. Cobb, Jr., invites scholars from a variety of religions to consider the relation between Whitehead's thought and the perspectives of their respective traditions. The authors generally argue for harmony between Whitehead and the various religious traditions, calling for mutual dialogue. They generally emphasize points of similarity between Whitehead and their respective traditions; more traditional interpreters would often stress points of contrast more strongly.

Rabbi Bradley Shavit Artson argues that much traditional Jewish thought resonates more deeply with Whitehead's cosmology than with theologies of creation *ex nihilo*. Artson reflects on Judaism and process theology from the perspective of the covenant, proposing that "covenant is always interactive, always connecting, and always relational" (7). Like Christian process theologians who have long maintained the coherence between process theology and the Bible, Artson argues that "process thinking offers a way to recover a more biblically and rabbinically dynamic articulation of God, world and covenant, integrating that portrayal with contemporary scientific knowledge of the cosmos" (7).

Catholic theologian and philosopher Joseph Bracken has long stressed the decisive importance of Whitehead's notion of society for understanding both divine and human life, as well as the experiences of objects in our everyday world. Societies in Bracken's view are "enduring structured fields of activity for their constituent actual entities at any given moment. . . . The field, in other words, provides the necessary continuity of pattern or form for successive generations of actual entities" (50). In a thoughtful reflection on Bernard Lee's process-inspired theology of the Catholic Church and its sacraments, Bracken calls for recognition of Christianity as "a Whiteheadian structured society with the different Christian denominations as its constituent sub-societies. . . . In my view, all of the world religions likewise contribute to an even bigger structured society, which in biblical terms may be called the Kingdom of God" (51). Bracken offers a creative and original synthesis of elements of Whitehead's cosmology and Catholic philosophical theology.

Protestant process theologian Marjorie Hewitt Suchocki rethinks the attributes of God, placing the divine omnipresence in the central position. She then interprets the meaning of God's power, knowledge and goodness in light of omnipresence. This perspective yields a vision of "a God whose power flows from God's energizing presence" (57). From this angle of vision, Suchocki reinterprets the classic Protestant theol-

ogy of grace: "Omnipresence, then, re-envision[s] the power of God from an 'out there' to an 'in here.' . . . Grace is simply another name for the creative, enabling power of God, meeting each becoming entity in its context, calling each entity toward its good. As an enabling rather than a forcing power, God's grace works with the freedom of each entity" (64).

Compared to the extensive Christian literature on process theology, relatively little has been written on the relation of Whitehead's cosmology to Islamic thought. In a pioneering essay, Mustafa Ruzgar reflects on the traditional Islamic questions of theodicy and divine power in dialogue with process perspectives. He claims that the Qur'an is pragmatic, addressing people's minds and hearts rather than speculating in systematic fashion on theoretical issues of free will and predestination. Guided in his interpretation of Islam by Abdulaziz Sachedina and Fazlur Rahman, Ruzgar constructs a dialogue between traditional Islamic thought and Whitehead's perspectives. Ruzgar argues, "The better balanced process view of divine and creaturely power is closer to what the Qur'an ultimately promotes. Process thought about God and the world better supports Islamic convictions about the centrality of revelation and prophethood together with God's interest in the world" (84). He explains, "The persuasive working of God makes more sense in the light of prophecy because it reveals more fully and realistically the merciful and compassionate aspect of God, two central attributes that are repeated in every Muslim's daily prayer" (84). In conclusion, Ruzgar notes the variety within traditional Islamic thought and urges all Muslims to engage in creative and critical reflection in dialogue with contemporary philosophers such as Whitehead.

Jeffrey D. Long, a practitioner of the Vedanta tradition of Hinduism as interpreted by Ramakrishna and Vivekananda, finds a close relationship between certain aspects of Hindu thought, such as the modified non-dual philosophy of the medieval thinker Ramanuja, and process thought. Long compares the Hindu figure of Ishvara, "the Lord," to Whitehead's understanding of God, and he compares jagat, "the world" (literally, "flow" or "process") in Hindu thought to Whitehead's understanding of the world as flow or the process. Long compares Hindu understandings of maya to creative transformation in process theology, noting the double meaning of maya as illusion and also as God's creative power: "Maya as creative transformation encompasses the notion of creativity, but also the idea of appearance. . . . As in the concept of maya, appearance may be deceptive, but it is also intrinsic to the creative process, the process of creative transformation" (120, 121). Seeking a constructive interchange, Long thinks that process philosophy can help Hindus recover the meaning of maya as creative transformation, to articulate the no-

tion of the soul, and to develop the understanding of religious pluralism. For its part, Hinduism contributes to process thought a long tradition of devotion to deities who are seen as powerful but not omnipotent. On a hopeful note, Long proposes that process thought and Hinduism together can “contribute to the larger project of the re-valuation of the natural world that is important not only to human well-being and wholeness, but also to combating the ecological crisis that the sense of nature as ‘mere’ matter, or as subservient to the arbitrary whims of a wholly transcendent God, has facilitated” (121).

Buddhist scholar Christopher Ives also approaches Whitehead in light of the contemporary ecological crisis, probing for possible resonances with resources in the Buddhist tradition. Ives believes that the Buddhist tradition faces limitations in addressing issues of “interdependence, responsibility, identification with nature, intrinsic value, equality, animal rights, and the sacredness of nature” (137). He urges Buddhists to consider the contribution of Whitehead in facing these concerns: “Process thought can help Buddhists think through the exact nature of sentience and its connection to intrinsic value” (139). John Cobb and David Griffin had noted that Whitehead stressed the vital importance of beauty and aesthetic values in the cosmos: “To maximize beauty is to maximize enjoyment. God’s purpose, then, can be described as the aim toward maximizing either beauty or enjoyment” (quoted by Ives, 152). Ives invites Buddhists to reflect on this perspective in light of traditional Buddhist values: “As Zen Buddhists—and nature writers around the world—have claimed, natural beauty can lift us out of our narrow selves and fill us with awe and wonder” (153). He closes by suggesting, “Perhaps Whitehead’s notions of beauty and the link he makes between beauty and intrinsic value can help Buddhists integrate beauty into their formulation of environmental ethics” (154).

Meijun Fan and Zhihe Wang survey the resonances between Whitehead’s philosophy and traditional Chinese values, especially the Dao, which they present as “a dynamic process, the creative advance of the world. It is becoming itself” (159). Noting that Chinese often does not distinguish between nouns and verbs, they present Dao as “a path and an action, a way and a process, according to which everything is in process and everything is in the state of incessant transformation” (159). This perspective provides a basis for a dialogue between Whitehead and Chinese thought. The authors note the difficulties of China’s earlier encounter with Western modernity, including anthropocentric disrespect for nature and nihilistic disdain for China’s Confucian tradition. They describe the present moment as a postmodern “Second Enlightenment” in which Chinese thinkers seek to retrieve the best of their own traditions in light of ecological awareness and in dialogue with Western thought.

In their view, “process thought and its representation, Constructive Post-modernism, help the Chinese find value and charm within their past because of its respectful attitude towards tradition” (173). Their hope is that process thought can help China progress toward environmentally friendly practices and policies, can shed light on the sociopolitical arena, and move beyond the destructive aspects of modernization to shape a healthy ecological civilization.

The final essay by Roland Faber and Catherine Keller reflects thoughtfully on the challenges of religious pluralism in light of Whiteheadian perspectives. While praising polyphilia (“the love of multiplicity”), they pose the provocative question of whether interreligious investigators behave as pirates in raiding other religious traditions and taking others’ treasures back home for display. They warn that the outcome of interreligious borrowing can resemble a pirate admiral showing off his stolen treasures and curiosities; and they caution, “Pirates do not just disappear, however. Some become emperors; others attack the empire’s integrity” (186).

How to handle religious diversity poses a variety of challenges. While praising openness to a variety of religious options and calling for “polydoxy—an inherently multiple teaching of the multiple”, Faber and Keller nonetheless assume that there is one reality behind the variety of religious traditions: “This many-folded matrix thus may be disclosed as theistic, divine and a nontheistic sacred. Indeed ‘S/He/It’ has been acquiring a singular multiplicity of names!” (186). They cite the Lotus Sutra of Mahayana Buddhism as an example of “the beautiful play of multiplicity,” and they claim the Lotus Sutra “dislodges any assumption that the sacred or divine controls the world or that only one religion can be true or that in all religions it would be only one expression of the sacred or that all the religions are indifferently true” (196-97). Faber and Keller do not note the Lotus Sutra’s harsh threat that those who disparage the Lotus Sutra will be condemned to suffering in the Avichi hell for countless ages. Faber and Keller also do not explain that the Lotus Sutra teaches that other teachings were appropriate only for earlier ages, and sees them as now outdated. The Lotus Sutra claims to supersede all earlier forms of Buddhism and to represent the only valid teaching for the present age. The Lotus Sutra forcefully condemns those who hold that the multiple Buddhist paths are all equally valid for the present age. Thus the use that Faber and Keller make of the Lotus Sutra is rather misleading and could even be seen as an example a pirate admiral taking possession of a treasure. Similarly, they cite the fifteenth-century Catholic Cardinal Nicholas of Cusa as teaching “a polydoxy that values an enfolded pluralism” (199) without noting that he accepted the exclusivist teaching of the Catholic Council of Florence in 1439.

Faber and Keller blame the Abrahamic traditions one-sidedly for religiously motivated violence in the world today, neglecting the violence done by Hindu and Buddhist groups in India, Sri Lanka, and Myanmar: “We seem to find ourselves in a historical period of renewed interreligious conflict and theocratic wills to power—largely variants on the sibling rivals of Abraham, vying with each other and with state secularism for dominance” (186). The authors recognize that not all things are to be loved and taught: “Polyphilia is not omniphilia, polydoxy not omnidoxy” (187), but they never fully clarify what are the criteria for what is to be valued and what is to be rejected. What emerges is a focus on immanence that seems to exclude any traditional experience or articulation of transcendence: “In such a sympathetic multiverse, perhaps in itself, nothing is ultimate—except the very concrecent cohesiveness of the polyphonic convergences and divergences” (189). The criterion that emerges is uncertainty: “The mystery of ‘the sacred or divine interactivity’ will only unfold as long as we don’t create orthodox animosities, but a healing uncertainty, a complexity of upaya, a complexifying opening of the blockings of the flow of sacred multiplicity” (201).

While more traditional practitioners of religious traditions will find much to question and critique in this volume, the essays provide much food for thought and bring attention to the resources of Whitehead that can help move a number of discussions forward.

Reviewed by
Leo D. Lefebure,
Matteo Ricci, S.J. Professor of Theology
Georgetown University

Biographies

Patrick Laude has been teaching at Georgetown since 1991. His scholarly interests lie in comparative spirituality, poetry, and Western interpretations of Islam and Asian contemplative and wisdom traditions. He has authored over ten books including: *Pathways to an Inner Islam* (SUNY, 2010), *Pray Without Ceasing* (World Wisdom, 2006), and *Divine Play, Sacred Laughter and Spiritual Understanding* (Palgrave, 2005).
laudep@georgetown.edu

Ravi Ravindra was born in India and received his early education there. He went to Canada as a graduate student and later as an immigrant. Now he is a Professor Emeritus at Dalhousie University, in Halifax, Nova Scotia, where he served for many years as a professor in three Departments: Comparative Religion, Philosophy, and Physics. He was a Member of the Institute of Advanced Study in Princeton, a Fellow of the Indian Institute of Advanced Study in Shimla, and the Founding Director of the Threshold Award for Integrative Knowledge. He has been a member of the Board of Judges for the prestigious Templeton Prize for Progress in Religion. Ravindra's spiritual search has led him to the teachings of J. Krishnamurti, G. Gurdjieff, Yoga, Zen, and a deep immersion in the mystical teachings of the Indian and Christian classical traditions.
raviravindra@eastlink.ca

Rupert Sheldrake is a biologist and author of more than 80 scientific papers and 10 books, including *The Science Delusion* (called *Science Set Free* in the US). He was a Fellow of Clare College, Cambridge University, a Research Fellow of the Royal Society, Principal Plant Physiologist at ICRISAT (the International Crops Research Institute for the Semi-Arid Tropics) in Hyderabad, India, and from 2005-2010 the Director of the Perrott-Warrick Project, funded from Trinity College, Cambridge. He is a Fellow of the Institute of Noetic Sciences, Petaluma, California, and a visiting professor at the Graduate Institute in Connecticut. His web site is www.sheldrake.org.
rsheldrake@clara.co.uk

Francisca Cho received her Ph.D. in the History of Religions in 1992 from the University of Chicago Divinity School, with a specialization in East Asian Buddhism. Her publications include, *Embracing Illusion: Truth and Fiction in the Dream of the Nine Clouds* (1996), *Everything Yearned For: Manhae's Poems of Love and Longing* (2005), and numerous

articles on Buddhism and film, and Buddhism and science. She is currently preparing a monograph on the topic of Buddhism and science.
chof@georgetown.edu

Nazife Şişman gained her BA degree in Economics from Bosphorus University and did post graduate studies in Sociology. She works as a freelance writer. Her writing interests centre on women issues in Muslim experience in modern periods. Identity politics, body politics and everyday life constitute her main study areas. Her publications include among others Emanet'ten Mülk'e: Kadın, Beden, Siyaset (Women, Body and Politics), Küreselleşmenin Peçesi İslam'ın Peçesi (Pawn of Globalisation, Veil of Islam), Başörtüsü: Sınırsız Dünyanın Yeni Sınırı (Headscarf: Border of a Borderless World). Her recent work, Yeni İnsan: Kaderle Tasarım Arasında (Human: Between Destiny and Design-2011) analyses the commercialization and technicalization of the body under recent biotechnological developments that alter our understanding of life and death.
nazifesisman@gmail.com

Jonathan K. Crane is the Raymond F. Schinazi Junior Scholar of Bioethics and Jewish Thoughts at Emory University's Center for Ethics. He is the author of Narratives and Jewish Bioethics, and co-editor of The Oxford Handbook of Jewish Ethics and Morality. He currently serves as the President of the Society of Jewish Ethics.
jonathan.k.crane@emory.edu

Alan Weber is Associate Professor of English, received his doctorate in Shakespeare in 1996 from SUNY Binghamton. He teaches writing, literature, and the history of medicine at the Weill Cornell Medical College in Doha, Qatar. He is the author and editor of books and publications on Shakespeare, and the history of science and medicine. He also conducts research in the fields of e-learning and Gulf education and sociology.
alw2010@qatar-med.cornell.edu

Philip Clayton is Ingraham Professor at Claremont School of Theology. He received the PhD from Yale University and previously held posts at Williams College and the California State University, as well as guest professorships at the University of Munich, the University of Cambridge, and Harvard University. He specializes in interreligious dialogue and the study of religion and science. Clayton has authored or edited some 24 books, most recently The Oxford Handbook of Religion and Science;

Religion and Science: The Basics (Routledge); and The Predicament of Belief: Science, Philosophy, Faith (Oxford).

pclayton@cst.edu

Philip Sheldrake is Senior Research Fellow in the Cambridge Theological Foundation, UK, and Director of the Institute for the Study of Contemporary Spirituality at the graduate Oblate School of Theology, San Antonio, Texas. He was previously William Leech Professorial Fellow at Durham University (2003-08) and Honorary Professor of Theology and research supervisor at the University of Wales (1998-2013). He is the author or editor of fourteen books, predominantly in the areas of spirituality and mysticism, including the New SCM/Westminster Dictionary of Christian Spirituality (2005). He is a Past President of the international Society for the Study of Christian Spirituality, linked to the American Academy of Religion, and is actively involved in exploring the role of spirituality in interreligious dialogue.

ps220@cam.ac.uk

Elizabeth Zelensky teaches at Georgetown University and has worked as a historical consultant for the US Department of State and Department of Justice. Her scholarly interests focus on the discourse of westernization and spirituality in pre-revolutionary Russia and has written *Windows to Heaven* (Brazos, 2005).

zelenske@georgetown.edu

Ashley Moyse is a PhD candidate in the Philosophy, Religion, and Theology discipline area at the University of Newcastle, Australia. His research focuses on the anthropology and ethics of Karl Barth in relation to the theory and practice of biomedical ethics. He is also Research Affiliate at the Vancouver School of Theology, Vancouver, Canada.

ashley.moyse@uon.edu.au

Senad Mrahorović is currently a PhD candidate at the International Institute of Islamic Thought and Civilization (ISTAC), Malaysia. His research interest includes Religious studies, Orientalism, Sufism, Philosophy, Tradition and various forms of art.

senad505@hotmail.com