

Science and Religion for the 21st Century

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Resumo

O que provavelmente teve início como um sentimento de assombro acerca dos estudos do céu e do nascimento do universo, aliado a visões místicas, deu origem às grandes religiões da humanidade. O que começou por ser uma forma inteligente de descrever o movimento dos planetas, assim como a invenção de engenhosos instrumentos e modos de medida dos movimentos terrestres, deu origem a um dos mais impressionantes empreendimentos humanos, ou seja, a ciência. Durante as últimas quatro décadas, ciência e religião cresceram como “irmãos”, algumas vezes brincando juntos, outras vezes tendo quezílias, mas sempre a enriquecer o espírito humano, promovendo o respeito mútuo e a tolerância.

Introduction: science and religion

Science is the human mind's quest to unravel the workings of the world. It is a collective effort to understand, explain, and grasp the perceived world. Religion is a search for meaning behind human existence, and a yearning to connect with the Whole. It arises from the recognition of the uniqueness of consciousness in the universe. Science and religion are the loftiest expressions of the human spirit.

The religious traditions of humankind emerged, it is said, from the cosmic visions of Vedic rishis, from the covenant of Moses with God, from the enlightenment of the Buddha, from the commitment to non-violence of Mahavira, from the sermons of Jesus of Nazareth, from the revelations to Prophet Mohammed, and from the syncretistic inspiration of Guru Nanak.

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Religion led to the formulation of ethical principles in the Judeo-Christian world, it fostered compassion in the Buddhist-Jaina world, it inspired sophisticated metaphysics in the Hindu world, and provoked massive scholarship in the Islamic context. When religion is a quest to communicate with the transcendent and the commitment to serve others, it elevates the human spirit to its highest potential.

At one time, science was but intelligent guessing about how the world was formed and how it ticks the way it does. With its empirical methodology, ingenious instruments, and mathematical analysis, modern science has made astounding advances in unveiling the secrets of the world. It has fathomed the deepest core of matter and the farthestmost depths of space. It has served to demolish plagues and pestilences, and the mindless fears that tormented our ancestors. When science is disinterested effort to comprehend perceived reality, and it results in enhancing the quality of life, in mitigating pain and disease, and in eradicating superstitions, it is a fruitful enterprise indeed.

Science and religion in the modern world

The history of human civilization is marked by several major revolutions, some slow and some abrupt, some dramatic and some subtle, some of local significance and some of global impact. Among the most important of these are the agricultural revolution which introduced sowing, harvesting, and storage of crops; the cultural revolution from which emerged abstract thoughts and ethical frameworks, as also philosophies and religious systems; the scientific revolution which changed the coordinates of our planet from cosmic center to an insignificant niche in an immeasurably vast expanse; and the industrial-technological revolution which harnesses matter and energy on the basis of an understanding of the workings of the physical world.

It would be a distortion of history to say that in earlier times there was neither science nor technology. From the unrecorded dawn of consciousness, when the human mind wondered and human hands turned a stone or a stick this way and that to feel and fathom what it was, science has been there in every community and culture. In periods now long past scientific creativity and discovery flourished in India and China, in Egypt and Mesopotamia, Greece and elsewhere. Devices have been contrived to

lessen muscular effort and facilitate human manipulation of the world since time immemorial. Wonderment and curiosity about the surroundings, and eagerness to diminish sweat and work are inherent to the human spirit.

Religion continues to be a potent force in modern societies. It is true that in certain quarters the doctrines of traditional religions are not being taken as seriously as they used to be. The power and performance of science have weakened some of the traditional claims of religions. Nevertheless, in a great many places all over the world, there is a resurgence of interest in religions and pseudo-religions, in cults and charismatic preachers. There are moves to repair historical institutional schisms, and to extend hands of friendship between religious adversaries.

The Internationalization of Science

The scientific revolution of the 16th century was significant not so much in the discarding of geocentricity though this was one of its earliest steps; not so much in the discovery of elliptical planetary orbits though this opened our visions to hitherto hidden aspects of the universe, not even so much in the formulation of the laws of motion, though these led to a deeper understanding of the physical world; but the scientific revolution was significant because it initiated a universality which has transformed the very nature of the enterprise.

Since the emergence of modern science, the enormous range of scientific efforts in different countries, and then in different continents, have come to be subsumed under a single umbrella, made up of an abstract international body of scientific practice and culture. The various nations of the world have their own research laboratories and publications, and yet, the works carried out and published in these geographically separated places are interwoven into a web held firm by invisible bonds that know no borders, that feel no cultural differences. The meter and the kilogram in any national bureau of standards are precisely the same, no matter what the religion or form of government may be in the country.

Science certainly has its local interests, narrow nationalism, and petty fights over priorities too. After all, it is only a human enterprise. There are rivalries and races in the pursuit of knowledge and competition in discoveries. There is national pride when a prize is announced. And yet, the

technical work of scientists is blind to nationalities, they overlap and mingle like sounds from different instruments in an orchestra to create and constitute the grand symphony that science is. The true strength and stature of modern science lies in its universality. Science is no longer bits of insights here and there, nor imaginative speculations by keen minds in particular cultures. It surely is not parochial ethnic interpretations of natural phenomena, nor narratives from sacred books. Rather, science is a collective quest, a restless drive to eradicate every misunderstanding in the interpretation of every occurrence from the micro to the macrocosm, to unravel every mystery and dispel every doubt and darkness from the inquiring mind.

What characterizes modern times is transnational science, and the ubiquity of modern technology. There is no member state of the United Nations Organization where science is not taught, or planes don't land. Whether one understands science or decries it, no serious thinker or leader in the twentieth century can ignore science, or function without its technological offshoots. The primary contribution of science has been the quenching of curiosity through disinterested search, the providing of intellectual satisfaction through its explanatory successes, and the enhancement of creature comforts through ingenious technology.

In spite of all our national differences and cultural diversity, no matter what language we speak and what creeds we subscribe to, the one common thread that connects the minds of men and women in today's world is international science. So too, the commonalties in the towns and cities of the modern world are electric lights and communication systems, automobiles and computers.

We live in a world where science and technology hold the sway. If we look around any spot on earth that has found its way into the mainstream of human history, we cannot escape the presence of wheels and wires, of gadgets and generators, of vaccines and pills. The material impacts of science, the magic and madness of machines are omnipresent and inevitable. Science and technology are here to stay, and their influences are likely to grow even more in times to come.

In no other context in human culture: not in art, nor in music, not in sports, much less in politics, do men and women of all races and colors, of all languages and religions, hold hands as comrades in a common pursuit. This speaks as much to the glory of the science as an enterprise, as all its technological triumph do.

Religion, Separate and Universal

The scientific revolution merged diverse streams of search into a single surging river, as it were. But nothing of the kind happened in the realm of religion. Here the ancient roots stayed separate and sturdy, and the trees grew taller and vigorous too, shooting out branches along different directions, but the branches of a tree drew nourishment from their respective roots. Whether it was Judaism or Buddhism, Hinduism, Christianity, or Islam, each gave rise to different sects and schools, but in each instance, there was a core which was safe and secure.

Unlike with science, there arose no common religious institution to embrace all the faiths of humankind to form a single superstructure unto which all would come and pray. True, there have been efforts to repair old divisions, attempts to heal historical wounds, even movements to bring out the best from all religions. But Din Ilahis and Unitarians, Bahais, and Brahmos have been elite groups, rather than major religions with mass followings. If anything, over the past few centuries, newer groups have come and gone, new prophets and cult leaders, have forged more movements still.

One reason for this is that science is concerned with the external world of cold reality, whereas religion is linked to inner warmth, to local moorings, trusted traditions, and close community. Every religion is affiliated, not only to ancient prophets and personages, but also to time-honored rites and rituals, which have acquired the weight of centuries and the wisdom of ages. To reject all this and embrace a global network is more difficult than to switch from the geocentric to the heliostatic model. To resonate with prayers from alien faiths is more difficult than to use telescopes and microscopes to explore the world.

So we find that in schools everywhere the same laws of nature and the same mathematics are taught, the same facts of anatomy and the same genetic structures are explained, but in places of worship different symbols are venerated, different eschatologies expounded, and different days prescribed for fasting and feasting.

Need for a Trans-denominational Religion

This persistence of religious diversity is understandable, even commendable. It has its cultural and aesthetic richness too. And yet, in a sense, the situation is also crying for fresh perspectives. For ours has become a complex world with complex interactions between peoples. It is a world where some nations are firmly affiliated to a single religious loyalty, while others foster religious pluralism. It is a world where economic injustices and political squabbles still disfigure human culture.

In such a world, if it is good to see people faithful to their traditions, it is also disconcerting when both shepherd and sheep are convinced that their particular path to Heaven or salvation is the only right one there is. In such a world, it becomes all the more imperative that we try to bridge the chasm that perilously separates the peoples of the world. It is urgent that enlightened religious leaders from every faith and intellectuals from every culture inspire men and women of goodwill to complement their local loyalties with a global vision of trans-denominational perspectives which would not only enrich their own sensitivities for the sacred and the spiritual, but also serve to lessen tensions and mistrust among the more ardent true-believers. In this effort, we need to extract from all religions whatever is best and overlapping in values and perspectives.

Blessings with blemishes

Neither science nor religion has been a blessing without a blemish. It is no secret that both have wrought much havoc in the world.

In their convictions as to the nature of the Divine and on who represents God here below, religions differ in profound ways. When a belief-system encounters a competing world view, spokespeople for religions tend to regard others as astray or evil. Left to itself, no religion recommends anything harmful towards others. However, when faced with people of a different faith or symbol, the zeal to convert emerges, and all the caring and submission to God tends to be transformed into big-brotherliness at best, into hate and hurt at worst. Human history is replete with ugly memories of mutual massacres, rampages, burnings at the stake, inquisitions and holy wars: all perpetrated in the name of religion. True

believers do not have the slightest doubt that their own religious, moral, and cosmological worldviews are the only correct ones. Where and when they acquire power over others, they can be far more dangerous than pious theists, cocksure atheists, or narrow fundamentalists in non-theocratic societies.

At this point in history, there is still hope that the hate and intolerance lurking in traditional religions may be subdued, tamed, and transformed. Yes, there are still pockets of religious animosity and persecution, but there are also places where self-righteous passions are restrained by enlightened laws. We may hope that some day sectarian cleansing and witch hunting will become mere embarrassments of history, and that the religions of the world will coexist in harmony.

Not all the outgrowths of science have been benign either. Scientific knowledge has given rise to germ warfare, chemical weapons, and nuclear holocausts. Then there are countless side effects of technology, from environmental pollution and population explosion to rain forest depletion, and global warming. Just as religion has been harmful through its doctrinal arrogance, science has been dangerous through its impacts which are endangering health and survival.

Harmony of earlier ages

There was a time when science and religion co-existed in happy harmony. During much of human history until the rise of modern science in the 16th and 17th centuries, it was religion that swayed the minds and actions of people. Whether in ancient Greece or Rome, in China, India, Egypt or in medieval Europe, the world view of the religion of the time and place determined how people lived, what their ethical framework was, and how they pictured the dark beyond. In traditional societies, men of science were also men of religious wisdom. They were privy to esoteric truths, they uttered magic formulas, and they initiated the young into the realms of occult lore. Priests were knowledge-bearers, astrologers were astronomers, and revealed books stated how the world came to be and why. There was no question of conflict between science and religion because the leaders in science and of religion were often the same personages.

Religiously inclined scientists and dimensions of religion

Even after the rise of modern science, there have been many creative scientific thinkers who have been deeply religious. This should lead any reasonable person to conclude that the call of religion has little to do with the appeal of science.

This is because religion has several dimensions which have nothing to do with science: Many of the doctrines of religions relate to God and the hereafter, often to matters that lie beyond the realm or reach of science. These are domains in which science has no concern and of which it has no inkling either. Religions also have a communal dimension which is manifest in their prescription of days of feasting and fasting, their specification of places of pilgrimage, and so on. Above all, religions have an ethical dimension that formulates rules of right conduct. Religions have symbols that soothe the heart and modes that uplift the spirit.

None of these has anything to do with gravitation or speed of light, with electricity or molecules. One may learn about the heliocentric nature of the solar system, and also subscribe to the doctrine of the Trinity. One may accept plate tectonics, and also fast during Ramadan, feast on Divali day, or light candle for Hanukkah. One may agree with Darwin's theory of evolution, and still visit holy shrines with reverence for the associated symbols. One may attach credence to space-time curvature and yet be kind to one's neighbor and faithful to one's spouse.

Equally importantly, religions enable us to perceive dimensions of the human experience that transcend logic and rationality. Like the aesthetic joy one derives from listening to glorious music or beholding a magnificent work of art, the religious experience endows us with an ineffable ecstasy that, no matter what its cerebral-neural origins, is a profoundly fulfilling human experience.

Thus, religious involvement is not just a possibility; in many instances, it is an inevitable part of being fully developed. Even those who disparage traditional religions and proudly proclaim themselves to be atheistic, materialistic, agnostic, or whatever, have some source, implicit or explicit, to quench their spiritual thirst. Even in nations which prohibit public religious expressions, they organize impressive parades and celebrate national heroes with great fanfare.

Moreover, profound questions have been raised on the intriguing coincidences in the values of the so-called fundamental constants which are

ultimately responsible for the kind of world we experience. In particular, carbon-based life (and its long range offshoot, the human mind) would be impossible if some of the constants had even slightly different values. This prompted the physicist-celebrity Stephen Hawking to write, “It would be very difficult to explain why the universe should have begun in just this way, except as the act of a God who intended to create beings like us.” This has led to the fascinating conjecture that the specific values were *intended* to give rise to quantum physicists and cosmologists. The eminent physicist Freeman Dyson declared more cautiously: “As we look out into the universe and identify the many accidents of physics and astronomy that have worked together to our benefit, it almost seems as if the universe must in some sense have known that we were coming.”

God is no longer a beautiful *hypothesis* as the First Cause, but a plausible, if not compelling *conclusion* from measured parameters. That an intelligent principle was the root cause of it all now seems to be more than a religious dogma.

Skeptics’ ineffective reaction

Die-hard skeptics still wonder why so many silent eons were frittered away in the lighting and snuffing of stupendously vast stars before *Homo sapiens* could come to the fore. An all-powerful Designer could surely have come up with the appropriate combination of constants to manufacture an Einstein and a Feynman in short order and in a smaller span of space, without the tortuous and time-consuming route of supernova furnaces for synthesizing heavier elements.

The point is, there are thinkers who seem to be genetically averse to any mention of God. They are convinced there is nothing beyond matter and energy in space and time. To them, those who speak of God and salvation are soft-hearted, misguided souls, unable to cope with the tribulations of life, people who naively continue to believe in a loftier version of the fairy tales of their infancy. To them beauty, love, meaning and the quest for truth are emergent properties of cerebral biochemistry, the elaborate details of which will be uncovered by neurophysiologists, molecular biologists, and computer scientists before the end of this new century.

While perhaps correctly recognizing that the universe is not anthropocentric, they fail to see that science is, in its very mode, anthropic. Take away

the human mind, and there can be no description of the world in terms of concepts like momentum and energy, let alone *visible* light, *short-lived* particles, and *audible* sound. The unswerving commitment of unbending materialists to the causal and the spatio-temporal, and their uncompromising rejection of anything spiritual can only be described (in terms of its deeply-felt attachment) as religious, much as they would abhor the epithet.

The lamentation of the no-nonsense hard-core school of scientists about the “demon haunted world” of scientific darkness into which, they fear, humanity is fast plunging, has been forcibly articulated by many. But such moaning, however eloquently and reasonably expressed, does not seem to be very effective. One reason for this is that die-hard scientists and rationalist-empiricists on the one hand and the rest of the decent people in society on the other, adopt different criteria for truth-content. Even among scientists, cultural sensibilities and spiritual penchants are variously developed.

We live in a world polluted by ugly spewing from the industrial age which, in the eyes of many, is a direct consequence of the scientific world view. Moreover, science offers a purposeless portrayal of a universe which, at least from the perspective of human consciousness, is replete with majesty and mystery, a universe where awe and beauty, love and laughter are more immediate than leptons, hadrons, and field bosons. Consider also the catastrophic pessimism into which thermodynamics and astrophysics dump us; and the fact that scientists keep changing their explanatory models like cars from Detroit or Osaka, making theories of past generations approximate, obsolete or downright wrong.

All the technical jargon of science can be understood only with mounds of sophisticated mathematics, abstruse terminology, and exhausting analytical techniques. Given that high school algebra is hard enough to master, not many are eager to buy into inscrutable science when rosier pictures are available for far less, especially when the perks of science, like antibiotics, TV, planes, computers, and hurricane prediction, can all be had without taking an oath of allegiance to scientific rationality and empiricism?

Need to recognize that the spiritual yearning is intrinsically human

All this reveals the fact that the yearning for spiritual experience is not an abnormal or trivial quirk of the mentally challenged, as some would

contend; but a deep-felt component of the healthy human heart. Though naturalist-thinkers have tried to explain this in terms of neurochemistry and Darwinian adaptation tricks, from the religious perspective, this yearning is implanted by the heavens above, by the Divinity that creates and sustains. If one insists, the religiously inclined would say that evolution and adaptation are themselves rules spelled out by the Almighty.

But whatever the source, whether it expresses itself as relentless search for supersymmetry, as poetic mysticism, or as faith in God, the thirst for an Abstract Beyond is part of thinking entities, unless they are chip-based. To some, the more one probes into the origin and evolution of the world, the more pointless it may all seem. But for countless others, if meaning and purpose do not exist, then, like Voltarian God, they have to be invented in the interest of sanity. Any system which denies these is regarded by many as more foe than friend to the human condition. Science as a belief system may not concern itself with these, but if it attributes them to human frailty and belittles their significance, it is not likely to win much adherence or applause.

With all its probing and with all its penetrating instruments and fertile formulas, science has not proved, and may never be able to prove, the non-existence of entities and principles that transcend the spatio-temporal physical world to which we are dimensionally condemned. It may rule them out as highly improbable. Nor can Science confine reality by fiat to only that which is tangible and instrumentally detectable, though it might define for its own purposes only that as reality which is subject to detection through physical means.

Science excites the mind and adds to our creature comforts, but religion stirs the soul and gives meaning to the life-experience. For a great many people, science cannot soothe the grieving heart, nor bring hope to the oppressed; it cannot add to the joys of relationship, nor give courage to the disheartened. For them, religion of one kind or another is a satisfying answer. Spokespersons for science must allow that there are matters that lie beyond logical proofs, mathematical formulas, and repeatable experiments, and extra-scientific existence does not make them any less significant for individuals and to groups.

Challenge for the coming century

Our challenge is to bring about a balance between amoral, no-nonsense science, and non-rational, enlightened religion. To trace Omnipotent God through Einstein's equations or vacuum fluctuations may be more than muddled mixing of metaphor and mathematics: it may be plain wrong. But it does not follow that the universe could not have emerged from the creative Mind of an omnipotent principle.

The vast majority of the truly faithful do not understand Frank Tipler, Victor Weisskopf, Fritz Capra *et al.* Nor do they feel the need for the approval of such authors to believe in the Almighty God of their tradition. They are not hankering for the sanction and support of esoteric equations to derive inner peace from meditation. The Bhagavad Gita, the Torah, the Dhammapada, the Bible, the Holy Koran, the Guru Granth Sahib, and other such texts offer much to spiritually inclined souls, even without the benefit of a knowledge of quarks or quantum field theory.

People who try to establish God on a *quod erat demonstrandum* basis overlook the fact that God is a sublime personal experience, not an entity hiding behind Higgs bosons or string theory, waiting to be uncovered like an Easter egg by theoretical physicists.

When it comes to a discussion of science and religion it may be useful to bear in mind that there is more to the human experience than *explaining* the world, hence many matters of significance, such as love, compassion, kindness, justice, aesthetics, and the relevance of the human spirit in a cold and apparently value-less cosmos, are beyond the purview of science. Science may explain how these come about, but that is irrelevant to the thrill we derive from them.

In our new century we need to create an amalgam of worldviews and values: the worldview components are to be drawn from whatever is reasonable, rational, and verifiable from the scientific perspective, and the value components are to be derived from whatever is ethical, meaningful, and fulfilling in traditional religious perspectives.

When it comes to interpreting an aspect of perceived reality in the phenomenal world, the new enlightenment will embrace the scientific mode, not because this is the truth, but because, on the weight of all available evidence at a given time, it is the most persuasive interpretation. It will discard the theory of yester-century if it fails in the scientific criteria for

truth content. This springs, not from disrespect for investigators of generations now no more, but because of untenability of older views in the light of newly gathered data.

Likewise, when it comes to embracing ethical principles and adopting moral stances, this framework will be inspired by the wisdom of the ages, enshrined in the revered texts of various religions. However, when these embody attitudes and injunctions which, no matter how appropriate they might have been in times past, are unacceptable in a more enlightened age, the new vision will not shy away from calling a spade a spade, and dumping outworn and unconscionable views and values into the dustbin of history.

The 20th century will be remembered for consciousness-raising and for its scientific/technological breakthroughs. That century made racism a bad word and shameful practice; recognized gender oppression as social evil; proclaimed human rights as transcending race, caste, and religion; pleaded for international economic justice; condemned the exploitation of the young began to celebrate diversity; and initiated care for the disabled. It released millions from colonial shackles, and it established world organizations in which free nations come together to solve their problems of food and health, trade and education, and resolve their political differences through discussions.

Future Visions

The course of human history is instigated by many factors, perceived and unperceived, gradual and sudden, tangible and intangible too. Thus, the rise of Buddha, Christ, or the Prophet Mohammed were among the major perceived factors, while the impact of certain viruses and microbes on the course of human history were never recognized as such. The impact of the Copernican-Galilean science was gradual, that of the French Revolution was sudden. The onset of the computer is a tangible factor, while that of the Human Rights concept is an intangible one.

So, when we forge visions about the Future, we can only be approximate in our assessment. And while we may be well-intentioned and enlightened in our planning, there is no telling what the future holds.

Now, as never before in human history, we have come to realize that we are all co-passengers in the only space-ship that is ours to share.

Fortified by the knowledge that come from the sciences, and enriched by the values and wisdom that come from traditions, we must make every effort to forget the antagonisms and animosities of the past, and strive to build a world civilization that will make this our planet a more rewarding place to be in.

Given all this, our goals for the coming millennium should be to recognize the positive aspects of all religions. Religions bring communities together. They offer satisfying answers to complex questions regarding the meaning and purpose of existence, and consequently a coherent worldview to the practitioners. They rest on thoughts and insights which have acquired a sanctity by virtue of their age. They make life and death meaningful through sacraments. We must nourish the emotional, spiritual, ethical, and inspirational enrichment that all the religions of the human family provide.

We may hope that the spirit of inquiry of science will evolve without losing sight of moral and human dimensions, and that our religious feelings will evolve along enlightened paths of tolerance and mutual respect, while individuals, in their local contexts continue to derive spiritual fulfillment through the names and symbols of their tradition.